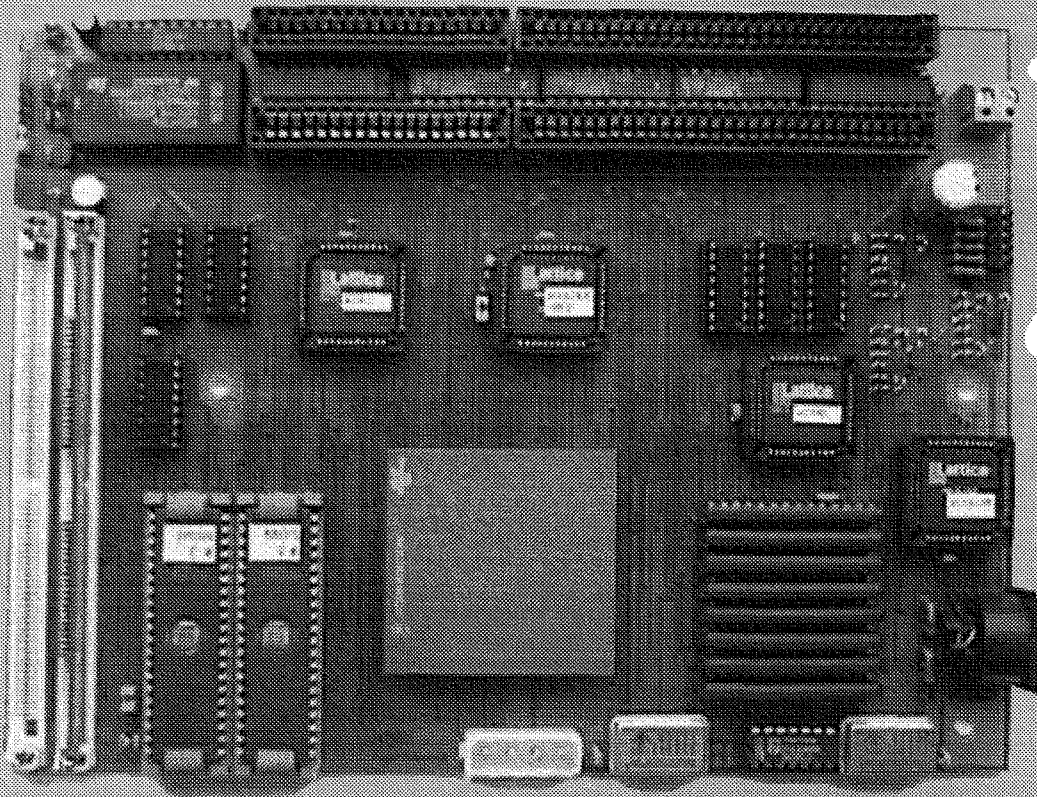


QL Today

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The Magazine about QL, QDOS,
Sinclair Computers, SMSQ...



**Q40 - the new
"QL" is closer
than you think!**

QL Today

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We welcome your comments, suggestions and articles. YOU make **QL Today** possible. We are constantly changing and adjusting to meet your needs and requirements. Articles for publication should be on a 3.5" disk (DD or HD) in ASCII, Quill or text87 format. Pictures may be in _SCR format, we can also handle GIF or TIF. To enhance your article you may wish to include Saved Screen dumps. PLEASE send a hardcopy of all screens to be included. Don't forget to specify where in the text you would like the screen placed.

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Issue 5:	15 December
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Editorial

Dilwyn Jones

Here's hoping that you had a Merry Christmas and that you'll have a happy new year in 1998. Things are moving on the QL scene, with the appearance of the Q40 "new QL", the improved 8301 and the ROMdisq, not to mention the Gold fire and so on.

On the software front, things are moving too. With this issue, we welcome a new software trader, RWAP Software, run by old QL hand Rich Mellor, known to many for his work on software formerly sold by CGH Services and DJC, now setting up in business to see if there is a demand for these older programs now no longer commercially available elsewhere. Rich is still involved with the QL scene, most notably as co-author of the Q-Route software from QBranch. I'm glad to see that smaller traders are still setting up on the QL scene, that it's not just being left to the virtual duopoly of Q-Branch and JMS. I'm aware that tentative enquiries have been made by another individual looking to advertise to offer specialist software to the QL scene, watch these pages for news.

While there is a lot of good news around on the QL scene, one especially bad piece of news was the burglary at Steve Johnson's premises, which caused him a severe disruption and inconvenience due to the theft of equipment and other things. While insurance can cover the financial cost of such happenings, it can never cover the cost due to disruption, lost time and frustration. What with his health problems and now this, poor Steve Johnson has been through the mill in the last couple of years and we can only wish him well, and hope that he will be back in action supplying PD software soon. He was at pains to point out he has backups of the stolen software etc, so all is definitely not lost!

It was thanks to some "new things" at work that this issue was nearly late. Not having had a proper day off work during December, thanks to my employer's decision to move offices and

studios during the pre-Christmas rush, I found myself immersed in not only training myself to use new facilities and computers, but training others to use them too on top of normal duties. Thus this issue was produced almost single handedly by Jochen Merz - my thanks both to him and to the contributors for their hard work to bring you this issue on time.

The next issue will mark the end of the second volume of QL Today and we'll mark the occasion with another cover disk, containing as many magazine listings (e.g. Herb Schaaf's graphics article) and reviewed PD software as we can fit on a disk! And if you're really lucky, we'll try to make sure the ZIP files work this time...

Dilwyn Jones



News

Turbo/Perfection News

Freddy Vachha of Digital Precision has allowed work to begin on co-ordinating updates to the Turbo compiler and the Perfection word processor. The work is being co-ordinated by a well known QL programmer, whose name we are not yet allowed to reveal. At the time of writing, the Turbo Toolkit was being updated, with work due to start on the Turbo code generator in 1998. Work already done on the Turbo Toolkit will allow it to work better on Minerva, SMSQ and SMSQ/E.

The upgrade to Perfection will allow it to take advantage of the enhanced screen resolutions now available, and will improve the cursor handling and configuration process. For example, it will hopefully prevent Perfection from grabbing the cursor while pointer environment is not loaded.

The updates to Turbo should be completed before work begins on Perfection. It is hoped that both will be available sometime during the first quarter of 1998. Upgrade terms are not yet available, but are expected to be fairly low cost, involving the return of some disks.

TF Services News

Tony Firshman reports that by the time you read this all the initial RomDisq production will be done. The hardware was on display at the Portishead Quanta workshop at the end of November, clearly showing the fine track sizes and high density. At that time, the software driver was not complete, although some work had clearly been done.

Tony Tebby has at the time of writing practically finished the driver so hopefully all will be released during mid December.

A future product from TF Services will be an adaptor to allow more than one ROM to be plugged into the QL.

Tony Firshman has moved, here are his new address and telephone number details (fido address unchanged).

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(+44)1442-828255

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**TF Services,
29 Longfield Road,
TRING,
Herts, HP23 4DG**

QBRANCH News

The Knight Safe - Mark Knight's Hard disk Backup utility - is now released priced at 30 pounds. This will back up onto floppy disks, a second hard disk or an Eazy drive and stores a list of which files are stored on which disk.

Q-Route is now version 1.03 and has fixed the bugs that stopped it finding routes on JS and JM ROM QLs. Some of the routines are now faster. Upgrades are free just send Master disk and return postage.

Barry Ansell is still struggling to find the bug which causes PD3/S to crash on an Atari but has fixed several other bugs reported to him. Again upgrades are free as above.

As reported elsewhere, Miracle Systems have now decided not to make the Ultra Gold Card, due to the planned Goldfire and Q40 systems.

QBranch are looking into marketing the Q40 system when it is finished because they were very impressed with the demonstration of the prototype at the Eindhoven show.

Finally, The Hove QL show will be on Sunday Febuary 22nd at the same venue as last years - The Excelsior Hotel (see backside of this magazine).

News from Jonathan Hudson

"gascade" is now at v1.07 with lots of new user requested features, including the ability to HOT_DO hotkeys and handle 'executable' data files via the "FileInfo" thing, making it easy to load files into obsolete programs like the Psion quartet via the keyboard queue. Full source, documentation and examples. "I think it is the most useful bit of freeware programming we have had for a long time" - Roy Wood.

"bruz" (Backup and Restore Utility), supporting complete disk filling, disk spanning for large files, user definable compression - none, compress (fast, medium efficiency), gzip (slower, very efficient). Archive files are in industry standard tar.Z or targz format, so QDOS backups can be inspected and unpacked with Winzip (Win95, NT) or tar/gzip (Unix). Pointer driven (requires MENU extensions). bruz 0.01 fixes some cosmetic bugs in the 0.00 beta and adds a log file option. Full source, documentation and examples. A complete hard disk backup solution.

qmenu.zip. Complete MENU_REXT library for c68. Supports even esoteric functions like 'Do and Report' and all the Scrap call backs. By Christopher Cave and Jonathan Hudson. Full source, copious documentation and examples. There is no excuse for 'C' programmers any more!

All available from

<http://www.jrhudson.demon.co.uk>

and other repositories of fine, free software.

News from Beginners Club, Italy

Andrea Carpi has sent us details of the new version of Screen Viewer, the pointer driven PIC and SCR viewer for QL graphics files. Screen Viewer v2.18 addresses a problem raised by Anthony Trice, whereby directories containing very large numbers of files can cause overflow beyond the numbers of files the older versions could handle. It is now possible to configure (with Config Level 1, the original PE program configuration utility) the maximum number of files you can have in each directory, the default being 500 which should suffice in most cases.

Jochen Merz Software News

QPC is now available in V1.41. Formatting a WIN file is really fast now. Also, some customers encountered problems with the automatic display mode detection (QPC stopped after writing "Emulation is running..."), which is fixed now.

A number of customers approached me about getting updates via the WWW. To me, WWW translates into "World Wide Wait", but this is not

the main reason why I do not plan to offer such a service. A much better alternative was suggested to me, here are the details: as most customers with a modem can easily access my BBS's (not necessarily the cheapest method, agreed, but in many cases cheaper than using the ordinary post, and faster too) the BBS's will stay. This free update service costs a lot of time and effort. Adding another free service, which is not really under my control (I can't specify who should be allowed to download given files via internet, and creating and maintaining passwords is even more work). Also, I cannot check who downloaded which file. I can't even tell if updates were requested at all or whether uploading was a waste of time. Server space costs money, and I am trying to cut down costs hereat the moment. All this rules out update downloads via WWW or FTP. The better idea seems to be, that customers subscribe to an update list and get new versions via email attachments as soon as they exist. Users would not need to check every now and then to see if something new exists, they get it delivered as soon as it appears. In addition, emails seem to work quite fast (if they work at all). If you are interested, visit my homepage - there is a special survey page to see how the acceptance would be:

<http://www.j-m-s.com/smsq/index.htm>

The survey does not only deal with the software updates (not many questions anyway) and you can also subscribe here for general email news.

Due to major work on the server which holds my WWW domain, lots of emails were missing or delivered late. Problems started 25th of November or so and ended Dec., 8th (I hope). If you sent an email during this time and you had no reply yet, then you probably know the reason now.

New versions of FIF1 and WINED exist which were modified to satisfy some customer suggestions. Updates are free, as usual.

News from Albin Hessler Software

Albin has re-organised his software so that maintainance is easier for him. They are now bundled (and named) differently:

EASYPTR Basic (before: Part 1 + 2) **DM 276,-**

EASYPTR CAsm (before: Part 3) **DM 138,-**

CueShell **DM 138,-**

All products will be in English only. Of course, they are still available via Jochen Merz Software, as before.

Software News from Mark Knight

As a prolific software author for the QL I was asked to give a brief report on the current versions of some of my titles available from QUANTA and the QL PD libraries. I have written a lot of freely available software and some commercial titles; some of it is in daily use by myself and many others but lots of people have never heard about it. As the whole point of writing free software is to see it used here is some information that should help you decide whether to look for it.

UTILITIES DISK: my current favourite disk of my own free software, contains the single most used program on my QL, the File Manager. The list is:

QL File Manager, v1.30 (v1.31 currently testing). For navigating directories, copying, moving, renaming files etc. Can copy a disk and include subdirectories and contents. Update dates can be moved with the files or updated. Uses Aurora/QXL screens. Fast, clear display including directories unsorted/sorted by date, name, extension/name, size etc. ascending/descending order. If you use proper directories try this program, if you don't try it anyway it may convert you.

Condense v2.02 and AutoIndent v2.05. A pair of programs written for the QUANTA editor. Condense compacts a SuperBASIC program by removing indenting and using some other tricks. The program may still be LRUN etc. after shrinking. AutoIndent puts indenting back in or adds it to listings that never had any. Can use Aurora/QXL screens.

QuickSet v1.20. The easiest way to edit QL character sets (or perhaps make the Perfection or Editor character set match your printer). Files included to show you how to use custom character sets in your programs.

BList 2.11. The best listing program for SuperBASIC, includes lots of printer drivers and an install program. Up to 160 translates, decimal justifies line numbers, optionally prints DEFine PROCedure and DEFine FuNction in bold, supports background printing even if your QL doesn't and more. Can use Aurora/QXL screens.

SuperAlarm v1.15. An proper alarm clock for the QL: you won't be able to ignore this when it goes off..

The Utilities disk also includes probably the QL's smallest screensaver program (160 BYTES, works with QL or Aurora, configurable delay), machine code extensions and example SuperBASIC files - oh, and CONFIGURE, a program that can configure the other programs and itself as well. On most programs you may configure ink,

paper and border colours, devices, filenames, window positions and many other defaults.

I also once cooperated with a friend to produce a really huge multiplayer shareware game called FINANCIAL CLIMES (annoys me how few people have registered - TWO - we will write no more shareware let me tell you). It's a share trading game but don't let that stop you, unless you had your sense of humour surgically removed at birth play it and you will laugh... For goodness sake if you like it REGISTER, the registered version is even better.

While on the subject of ShareWare I should mention POPCALC, a calculator program written to overcome my irritation at all the other calculators I have used on the QL. This program is CharityWare, which is like ShareWare but the money goes to a charity instead of the author of the program. Just as with Financial Climes only TWO people have registered, and this has annoyed me so much I will write no more ShareWare or CharityWare for the QL unless registrations pick up dramatically.

I remember the free software I wrote used to generate a lot of feedback too, even letters from users as far afield as Argentina and Poland. Now I get little feedback except from a few dedicated people in QUANTA. This is not because the software isn't used since I see it at shows, people simply don't bother writing. Well the result of this apathy is you have lost another author, because I will write no more free software for the QL, again unless things change dramatically (and this doesn't mean I want to get the numbers of letters I used to get - but none won't do it). I will continue to support and debug what I have written so far.

On a more cheerful note I have been producing masses of code recently and working with others to test my efforts. The first result, in the late test phase right now, is The Knight Safe, a hard disk backup program for QUBIDE and other QL hard disks. It does the lot, backs up and restores the directory structure, splits long files, scans the hard disk to calculate in advance the number of floppy disks required, it is very fast and dead simple to use. It works on QUBIDE and Miracle Hard disks and it should work on Rebel Electronics hard disks too (but not tested yet). It should be on sale by the beginning of December allowing for some delays.

There is more but I am not announcing anything from now on until it is so close to being ready that only my QL blowing up can stop it. Have fun everybody.

Mark Knight, 304, Portobello Road Notting Hill, LONDON, W10 5TA.

(0181) 932 6987 (Not after 9:30 p.m.)

■

Q40 - Project of a modern QL

Peter Graf

In the editorial of the German QL Today issue 4, Jochen Merz writes about the situation of home computers. He shows the increasing monopolization and its bad results, combined with an appeal to preserve the QL as a better alternative. Following his request for articles I would like to give a report on a new hardware development - the Q40.

Until this year's QL meeting in Solms the Q40 did not reach the public. So let me begin with a short description.

The Q40 is a new mainboard which simulates or replaces the QL hardware. It contains a Motorola 68040 microprocessor with a complete environment including high colour graphics, keyboard connector, sound and extension slots.

The board fits directly into an industry standard case and can easily be plugged to the power supply. ROM and RAM have a 32 bit wide data bus. DRAM modules (PS/2 SIMM) of up to 32 MB can be inserted, two sockets are available. Fast on-board 32 bit graphics offer 65536 colours in resolutions of up to 1024 x 512, but also the QL modes in their original address space.

In addition there is a port for MF-II keyboards, digital-analog-converters for stereo sound, a battery-buffered realtime clock and a 2 KB RAM which keeps its contents when the power is switched off.

The mainboard holds an IDE/IO card as an interface to 2 HD floppies, 2 IDE harddisks, 2 serial ports, a parallel port and a joystick. There are two extension slots with 16 data lines and 20 address lines. One of them is occupied by the IDE/IO card.

The Q40 project has now become reality after years of development. The Q40 was only a half-empty board in Solms, and is now a prototype that has already shown a lot of its hardware functions. But first let me tell some of the history:

I have been a Sinclair fan from the beginning and started with the ZX-81 and the Spectrum. I did not have my own QL for a long time, but I was able to watch the whole evolution of this machine because my brother (Claus Graf) uses

the QL since 1986. About seven years ago I built a 68020 acceleration card for the QL which worked, but never became ready for production, because money was short.

The QL operating system was ahead of its time. What Tony Tebby and others made out of it, is still modern and of extraordinary compactness and efficiency. The situation with the QL hardware is more complicated. Perhaps we can distinguish two main lines today. On the one hand we have the emulators in hardware, or on other computers (QXL, QPC for example). On the second line we have QL extensions, which need an original QL or parts out of it (SuperGoldCard, Aurora for example). Over the last years I have been missing the third line of compact and complete systems which could replace the QL.

One day I made the decision to develop a new mainboard myself. I knew it was a crazy enterprise to do it all in my spare time. But it had been a personal wish for a long time. Additionally I saw that other 680x0 systems also began to fade away.

When planning the Q40, I thought the following items were really important:

1. Fast graphics and many colours for modern monitors
2. Fast CPU
3. Simple mechanical handling and electrical connection
4. Support for IDE harddisks or CD ROM drive
5. Modern memory modules and simple upgrading
6. Connector for a modern keyboard

In the details there were many difficult decisions and compromises. For example let us think about sound. Some need no sound at all, others only a simple beep, and others want HiFi quality. I decided to generate the sound by two 8 bit digital-analog-converters at sampling rates of 10 or 20 kHz. You cannot achieve HiFi quality with this solution, but it can be handled easily (because there is no sound chip that needs special programming) and you have some more capabilities compared to the original QL.

Another example is the concept of the extension slots. On the one hand I wanted to keep the QL slot for nostalgia. On the other hand the 8 bit data bus of the QL has disadvantages concerning fast 16 bit IDE harddisks and there are not many QL extension cards for sale now that someone could use for a Q40. I started to think about a 16 bit bus. It should not be the ISA bus with its conflicting timings and partly not

useful signals. As a compromise the Q40 extension bus was defined with few signals and well-defined uncritical timings, but with the physical connector of the ISA bus. So you can use some ISA cards in the Q40 and a do-it-yourselfer can build his own hardware extension easily. Another advantage of this concept is that the drive-controller-chip needs not to be placed directly on the mainboard - a cost-saving IDE/IO card from industrial mass-production could be used instead, which holds a similar chip.

The Q40 mainboard has a size of 8.2 x 6.3 inch which is quite small, if you bear in mind that high-colour graphics, sound and buffered extension slots are on-board. The Q40 says goodbye to the QL case to offer reliable mounting in an industry standard case. There are only four screws, the cables and the IDE/IO card to fix. This comes close to the demands of many QL users, even if the goodbye to the "good old black box" gives a little melancholy feeling.

On 8th of November at the QL meeting in Eindhoven the first Q40 prototype was shown in action. The visitors could see high-colour graphics in the resolutions 512 x 256 and 1024 x 512, the QL screens, accesses to an IDE harddisk, real-time-clock, SER port and more. Because the adaption of SMSQ/E has not started yet, a special ROM was used.

The feedback from the visitors was unexpectedly good. People came to our stall constantly, so we could hardly drink or eat. In the afternoon we had the opportunity to discuss some technical details with Tony Tebby.

By the way, all Q40 specific data needed for low-level programming, like interrupt-handling, register and memory usage will be published to all users and will not be exclusively given to a few.

Finally something about the progress of development: A printed circuit board redesign is taking place now. After that the adaption of SMSQ/E can start. Additionally a 68060 version is under construction.

There is an interesting message from Motorola concerning the 68060: In April 1998 the production of the 68060 shall be improved to 0,42 micron gate technology. Because of this, faster timings with clock rates of 75 MHz will be achieved. Motorola neglected the 680x0 line for the last few years, so this is very good news.

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What's all this 'bad FAT' stuff, anyway?

"Nasta"

Before anyone thinks that this is the article where I publicly confess to messing up the design of Qubide, let me tell you that, sorry, no, it isn't. That is because the design certainly is not messed up. OK, you say, so why do I get these 'Bad FAT, try rebooting' messages on my system? And why does my Qubide lock up on occasion?

The first and foremost reason for this is that the Qubide doesn't have series terminating resistors in the IDE lines, just as the original IDE specs said it shouldn't. However, somewhere about a year ago, the latest revision of the standard suddenly sprouted a new appendix where it was humbly suggested that due to ever increasing speeds demanded from the IDE interface, and the use of CMOS technology the old calculation wasn't valid any more and that devices should in fact include termination resistors. Most new drives are designed with that in mind, and actually do have the termination resistors on board. Unfortunately, their operation can be foiled by having another drive hooked up, in a master-slave combination. The second problem is that the QL isn't exactly the example of good power and ground integrity. Of course, these two problems can aggravate each other in some pretty unpredictable ways, too. So how can they be avoided?

Avoiding the 'Bad FAT'

- **Keep the wiring neat.**

This can be of paramount importance, even if done by people who don't know the electric side of it. In fact, that is the reason Qplane was created, to avoid too much wire clutter from the various power supplies. Keep power and ground lines short, as well as ribbon cables and similar stuff. Do not splice cables too much, if you use connectors, use some of decent quality, and bundle together power and ground lines, don't leave them in a tangle with all sorts of other wires.

- **Connect ALL the power lines.**

The QL needs 5V, +12V and -12V power, and a ground line. Qplane applies them all automatically through a standard PC power socket if a PC power supply is used. Do NOT

rely on ground lines coming 'from somewhere else' such as floppy or IDE cables!!! It is true that they do come from there but it is a much longer route and that should be avoided. In addition, the route has drives or other devices in it, each of which adds it's own share of interference. In addition, if you don't use all the drives, and need to disconnect them, do NOT disconnect only the power, and leave the data cable attached! This will apply signals to a drive with no power which can damage it. The correct way is to disconnect it completely, or if that can't be done, then disconnect the data cable, while leaving the power attached.

- **One power supply.**

The best way to do this is by converting the QL to a PC type enclosure. Please note, I wrote PC type - it doesn't have to be a PC, it just has to have a single, powerful enough power supply, delivering 5, +12 and -12 Volt power. Say, 5V at 5, 12V at 2 and -12V with at least 0.1 Amps of current. Of course, this will mean converting the system to 5V power, and that alone isn't without its risks, see below. Avoid several power supplies, especially in 5V systems - in such applications the power supplies would have to be guaranteed to come up with the proper voltage at the same time, or in a defined sequence. In practice, this is almost impossible to guarantee unless all the power comes from the same power supply. Applying power in the wrong sequence can lead to damaged system components, the usual casualty in case of Qubide is the chip labeled GAL1.

- **Not all power supplies are created equal.**

That's why you can find PC enclosures that look similar, costing from 10 Pounds to 100 Pounds. Such is the way of the market. Look at the upper part of the lower half of the price range, meaning 20-50 pounds. Yes, I know it sounds expensive, but that is what I'd do even if I were building a PC. Which, as a matter of fact I tend to avoid like the plague these days. Some power supplies are abominable - producing loads of RF interference and the corresponding amount of power line noise. Some have abominable regulation characteristics, in particular I have seen one that would crash the system every time a floppy would start spinning. The new addition to your system, be it a drive or an expansion or some interface or other, might just be the straw that breaks the camel's back - and you might be blaming it for trouble your power supply is actually causing.

- **Correct conversion to 5V power.**

The original QL used 9V power internally, which was then locally regulated to 5V where needed. In fact, it could operate on anything between 8 and 10V, which meant that even with long and lossy power lines, there was plenty of tolerance margin on the 9V power supply. This is NOT so with 5V power. There is no regulation because the regulators (the 3-pin chips on heat-sinks, labeled 7805) are bypassed. There are two direct consequences of this - long and lossy wires are to be avoided whenever and wherever possible, because there is only a little tolerance margin (in fact, the circuits should operate from 5V +/- 5% power). Bear in mind that long wires are not only resistive, but also inductive. The later is notorious for presenting a bigger resistance the bigger the signal frequency. Power spikes and noise have components of very high frequency, and though inductive lines might help by filtering them out with their high 'resistance', in some cases that might also result in too high a loss, so there IS such a thing as 'too much of a good thing'. Secondly, all the 5V lines are one and the same, which means that power line interference one part of your QL makes will be able to interfere with the operation of another part. This was greatly reduced in 9V power systems, because the interference would have to pass through the regulator which would dampen it significantly, and in some cases it had to pass through two regulators, which did an even better job. What does this mean in practice? When converting a board to 5V power, pass the 5V line from the expansion connector on the board to the nearest 5V point on the board, and preferably to a point where a decoupling capacitor is soldered to the 5V line on the board. A decoupling capacitor can usually be found close to a chip, and it is soldered between the 5V and ground lines on the board. If you don't know exactly what needs to be done, reading this description, please ask someone who does to do this for you.

- **Pay attention to the GC and SGC peculiarities.**

Please DO NOT use the SGC 5V power connector, instead have it converted to 5V power by bypassing the on-board regulator (the 3-pin chip on the gold colored heatsink). The connector is of low quality, and the additional wires needed to get the 5V to it would aggravate an already serious situation. You MUST perform the clock modification on a GC, because otherwise the clock will not work. The obvious repercus-

sion will be the Qubide software stopping on initialization, right after it displays it's copyright message. The reason for this is it's waiting for the clock to count a few seconds, which will not happen if the clock isn't working!

- **Drives can generate interference too.**

In a system where the 5V line has suddenly become shared between parts that were never designed for that, interference will be shared as well. Floppy and hard drives are not exempt - they share a common 5V line with the rest of your system too! In case you suspect this, try the following: get a small ferrite toroid from a reputable electronics parts dealer, say 1cm inner diameter. You will notice that the power lines to the drives have two black, and two colored wires, usually red and yellow. Look carefully inside the part of the power connector at the end of the cable, the part that will mate with the connector on the drive. You will notice one or two small 'latches' on the contacts of the connector. Using a large pin, or a very small screwdriver, unlatch the pins connected to the red and yellow wire from the connector body, and pull them out. Be sure to note where they were, you will need to put them back again. Take both the ends of the wires and pass them through the toroid a couple of times. Be sure they pass in the same direction (look at them as windings, and they should both go either clockwise or anti-clockwise, not in opposite directions!). Re-latch the wires into the connector body, making doubly sure they are back in the positions they were, otherwise your drives will be on a quick route to the eternal pastures. Use figure 1 on the next page as reference.

- **Add-on boards can generate interference too.**

One of the most notorious is the GC. It helps to modify the bypass of the 5V regulator, so that the first and third pin are not soldered together by a piece of wire, but by a piece of wire passed a couple of times (5-10) through a small toroid, much like the one described above. SGCs can also benefit from this, and so can Qubides, and ESPECIALLY the original QL motherboard. In fact, it is highly advisable to make an original QL motherboard 'bomb-proof' (you will need a very old issue of Quanta where this is explained) before a 5V conversion. Of course, some of the 'bomb proofing' has to do with the 5V regulator so obviously you won't need to do those modifications.

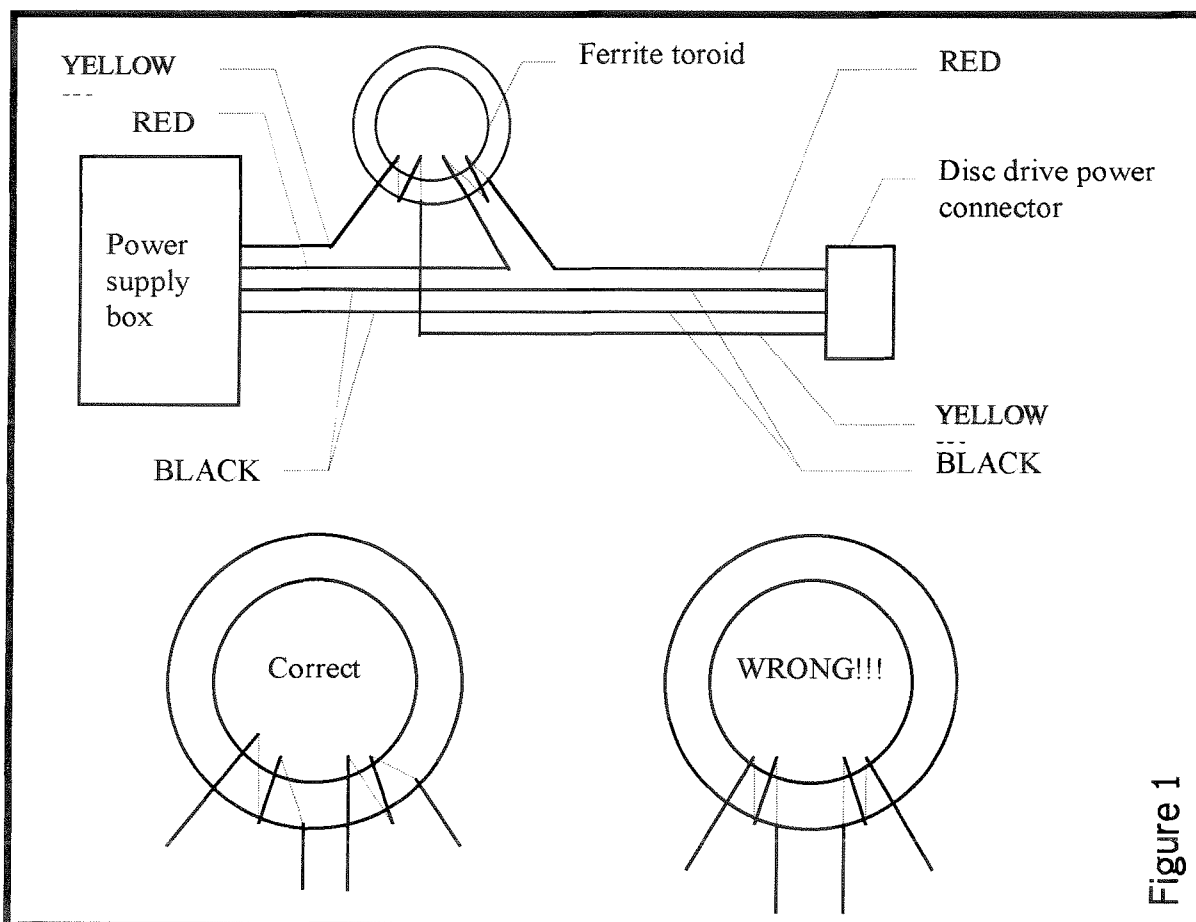


Figure 1

- **The 5V jumper trick.**

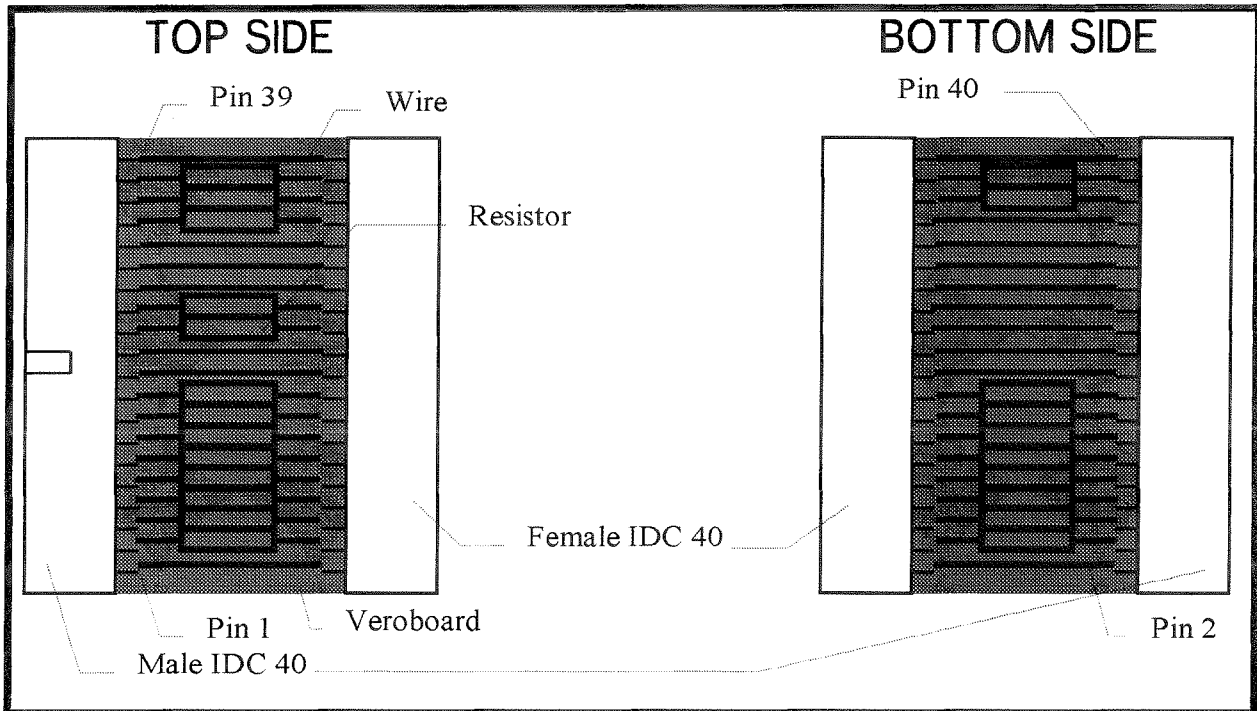
Some users have discovered that the problems stop if they use the Qubide set to 9V operation in a 5V system. In effect, the regulator which is on board is not bypassed. Curiously enough, none have ever thought of measuring the power supply voltage on the Qubide itself, after this little 'trick' is applied - they would be shocked to find about 4V, a far cry from the 5V+5% specification! The reason this works is pure luck - most circuits on the Qubide have a much larger operating voltage margin, BUT they are connected to other circuits, like the rest of the QL and the drives which use 5V signals. As a general rule, signals should not be applied that are higher in magnitude than the supply voltage. Most of the chips on Qubide have built in protection networks, but they were NOT designed to operate continuously, which is in essence what they would be doing in such a setup. Although this might work for ages, it might also result in damage to Qubide components, the chip marked GAL1 being first on the list. In case your system uses a single power supply, use this ONLY if everything else fails to produce a result. If you have a separate supply powering the drives, GAL1 on Qubide might go up in flames.

- **Termination.**

If everything else fails, you might consider making a series termination network. You will need a male and female IDE connector, a small piece of prototyping board (veroboard), some wire, and 23 resistors, 33 to 47 ohm each, the smallest you can find (and still see them :-). You will find that it can be very difficult to find solderable female IDC 40 pin connectors (female IDE), but even a flat cable connector without the top plastic assembly where the flat cable goes, i.e. with the 'knife' contacts exposed will do fine, with a little bit of care. The best type of veroboard to use would be the striped kind, with copper stripes 1/10" (2.54 mm) apart. The purpose of the terminator is to insert the resistors into the 16 data, 3 address and 4 control lines on the IDE cable, all the other lines are left intact. Cut out a small piece of veroboard, if you use the striped kind, the width should be 20 stripes (50.8 mm approximately), and the length about 2 cm. Solder the connectors along the longer edge of the veroboard, male on one side and female on the other, taking care that the orientation is correct, i.e. pins with the same number on the male and female connector are directly across one another. The best way to do this is to put the veroboard edgewise between the two rows of pins on both connectors, and

solder the pins onto the veroboard. Unless you have managed to obtain double sided striped veroboard, only one row will be soldered, but that's OK. Next, you will need to locate pins 3 through 18 inclusive, and pins 23, 25, 33, and 35 through 38 inclusive. Keep in mind that all even numbered pins are in one row, and all odd numbered pins are in the other row of an IDE connector. For the mentioned pins, use the resistors to bridge the pin from the female to the male connector. For all the other pins, use a piece of

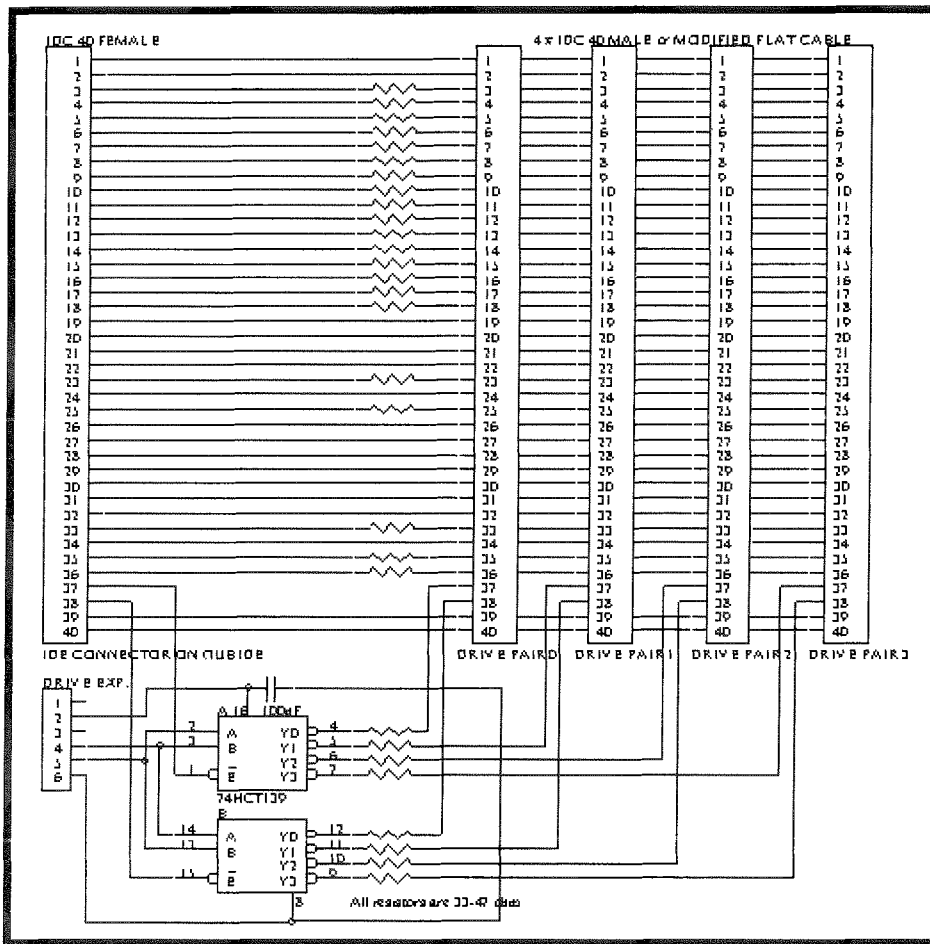
wire. If you have been using striped veroboard, be sure to cut the stripes where you use the resistors, and leave them where you don't, saving a couple of pieces of wire. Use the picture below for reference. The terminator should be inserted between the IDE connector on the drive and the cable, in case you use one drive, and between the Qubide connector and the cable in case you use more than one. Take care to make everything mechanically stable.



• **Beware of master-slave combinations.**

This is very tricky business, even under the best of circumstances. I am personally aware of at least one case where even two identical drives failed to work in a master-slave arrangement although all the jumpers on the drives were set according to the manufacturer's specs. The only remedy I can think of is changing the assignments of the drives, i.e. making the slave a master and the master a slave. Sometimes, the system will not start unless it's reset manually again, this is a problem with the drive itself, not with Qubide. Also, some pairs just don't work, no matter what you do. Note that another drive is another load on the power supply, are you sure it can handle it? Sometimes this will worsen the noise on the power lines and you may have to apply one or two of the toroids as mentioned above. The Qubide does provide a possibility to avoid master-slave combinations altogether, but this involves constructing a so called drive expander cable. In practice, this is an external circuit which can 'mimic' several IDE interfaces, using the

Qubide 'drive expansion' connector, this is the small 6-pin header right beside the IDE socket on the Qubide. It provides power pins for an external chip and several address lines used for decoding. When such a combination is used, series termination becomes almost mandatory, although I have constructed several of these cables and some have managed to work without termination altogether, while some have produced nothing but problems. A schematic for a simple 4-way expander (meaning up to 4 master-slave pairs, although it's preferable to make that 4 master devices only, otherwise why the expander) is given below. It is possible to construct this on a piece of veroboard, but the actual prototypes used surface-mount chips to keep the PCB small. Since this type of construction needs some experience, I will assume people who will build such an expander have the necessary knowledge to make the schematic into actual hardware. Pin 1 on the 6-pin drive expansion connector is the furthest from the 2-pin drive activity LED connector on Qubide.



Final note

All the bewares and fixes noted above can help in most situations, though there have been systems which are extremely stubborn for which they will not. In all cases of these that I have seen, something was dangerously wrong with some board in the system or some other part of hardware so it was a wonder it worked before. I myself have a very simple system consisting of an Aurora (with superHermes), Qplane, Qubide and SGC, a single 1.44Mb floppy, and an EZdrive, which has never given me the above problems, but of course, as the author of Qubide, in times where things were different (for instance I had a whole lot of problems to

• The Qubide Through-port

It has been observed that some systems stop producing the 'FAT is wrong...' message if the Qubide is plugged into a backplane, and then the GC or SGC is plugged into the Qubide through-port. Unfortunately, this has to do with the SGC and especially GC driving the expansion bus with very fast signals, which sometimes results in serious overshoot on the said signals (I have seen amplitudes of 7V, which is supposedly not possible with 5V supply!). The proper cure would of course be to use the same idea as on the IDE cable - series termination resistors. However, this is extremely impractical, so sometimes reshuffling the components in your system can help. It is even possible to plug the Qubide into a QL motherboard or Aurora and then plug the combination into a backplane, and plug a GC or SGC into the backplane directly. Shuffling components is always a good idea, but it is only a quick fix - it is likely that a new add-on will again change things. If it is apparent that shuffling components work, you might consider using a few of the already notorious toroids in your system, to bridge the 7805 regulators.

find a GC at the time to do tests), I have tried to test as many configurations as possible. Unfortunately much has changed so the above is the compilation of problems and fixes for them that have come up through the years Qubide has been 'in service'. I hope they have helped. Next time, we unravel the mysteries of serial ports.

ProWesS Apps Quick Look

Jim Hunkins

This review takes a quick look at three different applications available from PROGs that use ProWesS. The first, Font Utilities, gives the user different font management capabilities. The second, PFList uses the ProWesS engine to make high quality printouts. The final, Line Design, is a vector drawing program. The review of the first two applications will be fairly complete, while I will limit the Line Design to comments about the update which now uses ProWesS menus, printing, etc. Please see

previous reviews for in depth comments on Line Design. All the applications take full advantage of the ProWesS windowing system, including sizing, moving, etc. They also use the ProWesS HTML Reader for their help files (figure 1). As I have mentioned in previous reviews, this makes the help easy to use, especially with the hyperlinks which allow you to move to any subject in the help with the single click of the mouse. The only disadvantage of using the help, again

previously mentioned, would be with a slow system where the help files take a bit of time to be initially displayed. On a SuperGold Card or QXL the time delay is minor but under QPC on a Pentium 486 laptop in power saving battery mode, it is very inconvenient. If you are using a slow system and find yourself referring to manuals on a regular basis, you might want to take the time up front to print the manuals through the ProWesS HTML Reader. ProWesS applications, as you might have guessed by this statement, depend entirely on their electronic manuals other than for rudimentary installation instructions. Loading is very easy as it uses the ProWesS loader program (figure 2). This allows loading with just a few mouse clicks. Your



Figure 2 - Install startup window

installation choices include picking your destination directory, whether you want a new install or update, and even to add the help files to the HTML Reader's Bookmarks (a quick way from the reader to open the help files). At the end of the installation, the system even offers to add the program to one of your ProWesS buttons or make a new one for you. Again, very convenient.

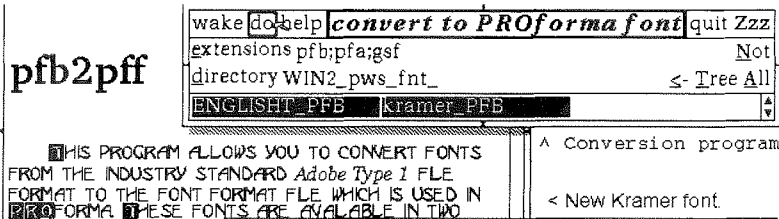


Figure 3 - Font conversion with new font displayed

Font Utilities

This package is made up of three separate programs.

Pfb2pff - allows conversion of Adobe Type 1 Fonts to ProWesS format;

FontShow - shows in detail all the characters of any loaded font;

FontPreview - allows a quick glance at how any loaded font will look

on your screen.

Pfb2pff: This program converts Adobe Type 1 fonts to ProWesS fonts. Adobe fonts are available as part of many shareware CDs or from the Internet. Caution is advised as a poorly designed Adobe font will give a poorly designed ProWesS fonts. Some of the free Adobe fonts are not worth the download time. With that caution given, when you find a good source of Adobe fonts, this program will allow you to use them in your ProWesS programs, making hundreds of fonts possible. But please, restrict your use to only 4 to 8 fonts at a time, due to both performance/memory usage considerations and document viewability. Too many fonts will clutter your image and make it difficult to view. To use the

program you simply execute it and select a font or fonts you want to convert by picking the font name(s) with the left mouse button. All convertible fonts ending in

pfb, pfa, or gsf are shown in the programs file

Once selected, simply choose the 'do' button. Alternately, for a single font, using the right mouse button on the font's name will select the font and start the conversion without having to do a separate hit on the 'do' button. For a bit of time, the program will crank away and eventually output a file in the original font's directory with the same name but ending in 'pff'. This font can then be loaded into ProForma with the configure PROforma program or manually by editing the PROforma_cfg file. The font must be in the font search path or moved with the rest of your PROforma fonts. You should also be aware that if you convert a font with the same name as a font already loaded, the new font will not be loaded. The name is embedded in the font file and is not related to the name. Normally you would be replacing the original font so the best solution is to move the original font from the font directory and remove it from the PROforma_cfg file manually before adding the new font. This program is very easy to use. The only problem I have with it is in how it shows you that it is busy. Instead of a 'processing' type message or some other obvious notation, while it converts the font(s) the cursor changes to the standard 'I' in a circle. Once the cursor resumes its original shape, the font(s) has been converted. A message or other screen change would be more intuitive. Again, this is a minor point and does not effect the use of the program.

FontShow: This program displays in detail any font that you have loaded into ProForma on your system (ProForma is the software that handles fonts under ProWesS). Its startup screen is fairly simple (Figure 4).

If you choose to print out the fonts (I have done this for all my fonts as a reference guide), you use the device option to choose the connection to your printer (such as PAR). The driver option allows you to choose between the screen (screen driver is

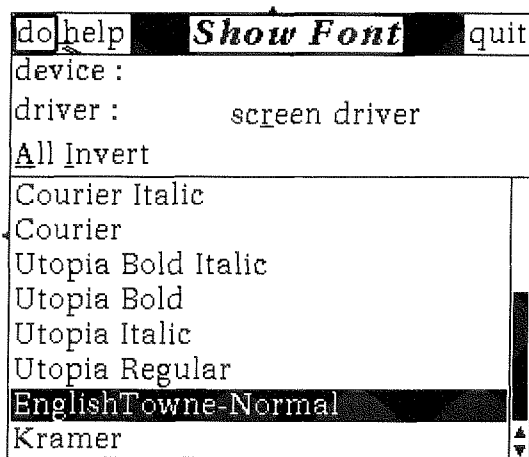


Figure 4 - Show Font startup window

shown in figure 4) or different printer drivers. This option gives you a menu of all drivers loaded so that you don't have to remember details. Once you have chosen the display

options, you can choose any number of fonts to display by clicking on the font name(s) with your left mouse button. You can also choose the 'All' option to display all the fonts. An 'Invert' option is also available which simply de-selects the selected fonts and selects the ones which were not previously selected. Once you have selected the fonts to view, clicking on the 'do' button brings up a larger window which will start generating all the characters in the selected font(s) and include their names (figure 5). One useful addition to this program would be to actually show the key press required for each character,

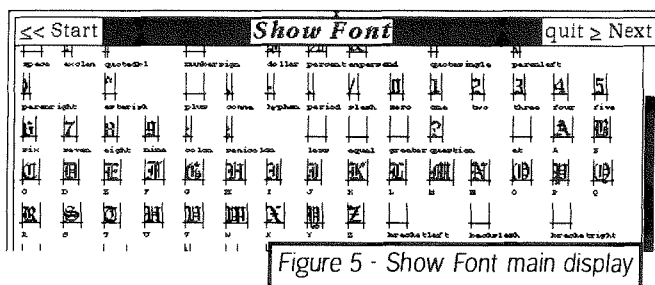


Figure 5 - Show Font main display

as some of the fonts contain special characters not directly shown on the keyboard. I have manually tested each font and added these notes to my printouts. If the chosen font(s) require more than one screen (if you are using the screen display), you can use the scroll bar, the 'Next' button, or the 'SHIFT >' key press to view the next screen. You also have the option to return to the first screen with the 'Start' button or the 'SHIFT <' keypress. As with most ProWesS programs, you can also make a single font selection by clicking the right hand mouse button when over any

single font, bypassing the hit on the 'do' button. The font display takes a while to generate which is probably because the fonts being displayed are usually not cached and are drawn fairly large so that you can see the detail. For this type of program, the speed is not really an issue. However, it would be nice if you could stop the program from generating the current font by depressing the 'ESC' key. Many times I found myself looking at a font that I immediately knew that I was not interested in and wishing I could stop the display and go to the next one. Currently you have to wait until the display is done. Again,

this would be a nice improvement but is not a major issue. My major use for this program has been in generating a reference guide to my fonts and this definitely has made it easy to do.

FontPreview: This simple program is my favorite of this group. It allows you to quickly take a look at how any font that you have loaded onto your system looks. I use it to compare fonts, allowing me to choose the right one for the job. In the left window (Figure 6) is a list of all the fonts that you have loaded. If you have too many to show, the window is scrollable with a scroll bar as shown in Figure 6. Clicking on any of these fonts will change the font shown in the 'font preView' window in the lower right hand corner. The amount of time that the change in the font preView window occurs depends on your system but it seems to be fast enough to

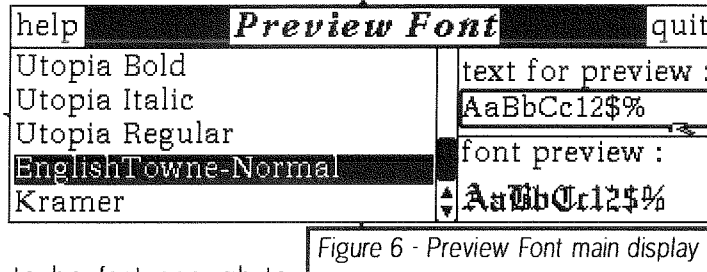


Figure 6 - Preview Font main display

make the program very useful. You can also change the text shown in the preView window by clicking with the left mouse button on the text shown in the upper right hand corner in the 'text for preView' window. You can enter any text you want there and it will be shown in the 'font preView' window in the chosen font. If the font displayed doesn't show all the characters you have chosen, you can widen the window to see more. You can also resize the height of the window which changes the size of the font being displayed. This is very useful to compare how different fonts will display in different sizes. I find that many of the fonts do not do well when too small so I use this to test for this possible limitation. This is a simple program but, as I mentioned, I have personally found it the most useful of the three on a daily basis.

PFList

This program produces high quality printouts of text files. Please note the words 'high quality'. To generate this quality, the program uses ProWesS PROforma to generate the output and is not nearly as fast as simple text output to a printer that uses the printer's built in font. But the results are much more readable and useful. It can print in landscape (horizontal) or portrait (vertical) modes, one or two columns, and with your choice of font and font size. Personally, I like to cram a lot of stuff onto a page when listing my code, so I take advantage of fonts all the way down to 6 and

the results are astonishingly clear (this of course assumes that you are using a 300 dpi or better printer for such a small size - I use an Epson Stylus Color 360 dpi). The program also allows you to add footers to each page with your choice of text and optionally the file name and current date. To choose a file or files to print, you set a directory as shown in Figure 7. You can choose which files PFList will display to choose from by entering your choice of extensions. For

example, if you want to choose from 'C' source files and include files, you could set extensions to 'c,h'. PFList will then show all the files in the selected directory ending in _c and _h. You

can use the left mouse button or space bar to select all the files to print. Assuming everything else is already set, just choose the 'do' button to start the print jobs. You can alternately use the right mouse button or 'ENTER' key on a single name to print just that file. While the program takes some time to print, it does take advantage of the QDOS multi-tasking and prints in the background, allowing you to continue with whatever you would like to work on. A speed up hint: if you are using a 300 dpi or higher resolution

printer and don't need ultra high quality output, by choosing a printer driver with a lower resolution, your output speed increases dramatically. I use this when I output quick interim listings and it really helps. Then when I do my 'final' documentation, I switch back to the higher resolution driver.

The following table will give you an idea of some sample printing times. These prints were of a file (3200 bytes in length) that generated just over three portrait size pages of fine pitch text. I used a QXL 20MHz card in a Pentium 133MHz computer, and a Epson Stylus Color printer. Note the large speed difference between the 180 and 360 dpi driver outputs. The quality of the 180 dpi driver on my Epson, while lighter, is actually quite good. The first times are from when PFList starts

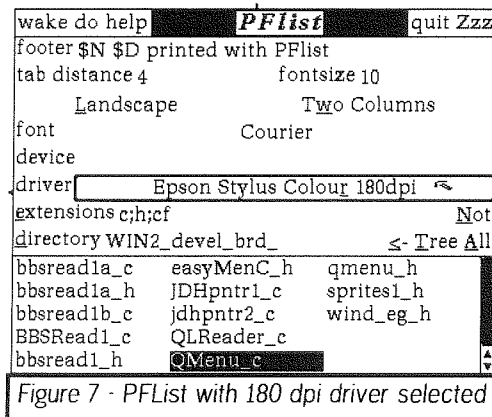


Figure 7 - PFList with 180 dpi driver selected

generating output to when the program finishes generating output. The total print time is from when PFList first starts generating output (which goes almost immediately to the printer) until the

printer actually finishes the job. The print spooling capability of our systems explains the difference in the two times.

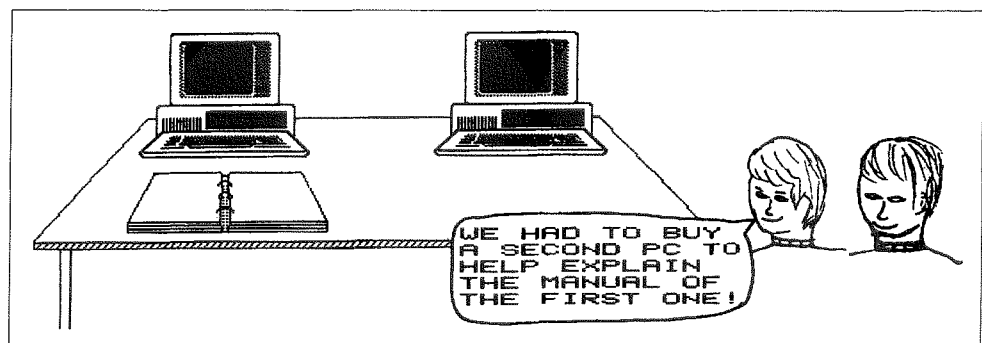
Driver	Generate Output	Total Print Time
180 dpi Portrait Single Column	0 min 13 sec	1 min 30 sec
360 dpi Portrait Single Column	3 min 30 sec	4 min 45 sec
360 dpi Portrait Double Column	2 min 00 sec	2 min 50 sec
360 dpi Landscape Single Column	4 min 10 sec	5 min 55 sec
360 dpi Landscape Double Column	3 min 00 sec	4 min 30 sec

Another few cautions. This program does not word wrap. So if your lines are longer than the page, they will be cut off. I ran into this with Portrait Double column quite often with my listings. The other caution refers to a rather nice feature of the program. You must make sure that you set the tab length to match what you actually want. This will allow you to match the formatting your editor showed you on your monitor. If you don't match it up, you may get some hard to read output (this is a common problem in the PC world where most printer drivers seem to have one preset tab size). While this program does only one straight forward task, it does fill a major gap in the QL software world and supplies us with high quality output. It is functional, and while slow, does its job admirably well.

Line Design

Line Design, the PROG's vector graphics program has always been a powerful application and has used the pointer environment in a fairly user friendly way. Line Design previously used the PROforma part of the ProWesS package for drawing, font handling and printing. The current update goes one step further and now uses the ProWesS windowing package. This means if you update, you must also have the ProWesS package loaded on your system. The current differences from the use of ProWesS are not too visual. Only minor differences can be found in the menus with the exception of the Display menu which has three new options, Show bitmaps, PreView when transforming, Use intersection for lasso select. The ability to show bitmaps is a needed enhancement and the last option, using the intersection, really

helps when trying to select certain objects. While these are not ProWesS related, they do make the upgrade desirable. Other minor bug fixes have also been included. The normal ProWesS Help button is now part of the window frame for LineDesign but on my copy, it did not seem to work. Either I did not get my help files loaded right or it has not been implemented yet for this one program. The greatest impact on LineDesign may be in the near future. The ability to handle color is already built into the ProWesS package but is not currently implemented in LineDesign except for grey shades. But since the capability is in the package, it should be a relatively simple thing to implement which would make LineDesign even more desirable. And with the upcoming 256+ color drivers for SMSQ/E and Aurora, the creative potential could be staggering. The only major part of the windowing package not used is the resizing capability. My wish list for LineDesign, in addition to color capability, includes the ability to resize the main window so that it does not take the entire screen. To recap my LineDesign comments, the update is only usable by those with ProWesS loaded on their systems. While adding some basic functional improvements, the greatest advantage to LineDesign under ProWesS may yet be in the near future. But since the upgrade is basically free if you have or are already planning to buy ProWesS, I would recommend considering it.



Glossary of Abbreviations and Terms: I ... S

Dilwyn Jones

INT - Interrupt or Integer. An interrupt is a signal to a microprocessor within a computer that occurs on a regular basis, normally 50 or 60 times a second, or from time to time as required. It means that something is demanding attention and time from the processor, requesting that the processor suspends what it's doing and diverts to whatever device or routine that needs the attention.

ISDN - Integrated Services Digital Network. Basically a posh name for the digital telephone network. I use ISDN a lot for sending broadcast audio as part of my day-job, and when it fails I tend to call it 'It Sends Dilwyn Nuts!'

ISO - International Standards Organisation.

JPEG - Joint Photographic Expert Group, name of a body to agree on graphics compression standards for still pictures. Used generally to describe a file saved in this format. Not in widespread use on the QL, though there is a QL PD program to convert between JPEG and GIF, and there are several GIF file readers for the QL.

KB - Abbreviation for KiloByte, or 1,024 byte. The unit 1,024 is used rather than 1,000 as it is a number which is a power of 2, which makes it easier and more logical to handle in computer terms. 1,024 KB makes 1 MB or 1 Mega-Byte, see below.

KHz - kiloHertz, a measure of the number of cycles per second.

LONG WORD - 2 Words or 4 bytes of computer memory. Sometimes referred to as a 32 bit value. For those who understand binary numbers, this corresponds to a 32 digit binary number, so a long word of computer memory can store quite large values.

LQ - Letter quality, a term used to describe print quality.

LSB - Least Significant Byte, the lowest 8 bits of a numeric value. When you write the number as a binary form, this will be the rightmost 8 bits.

MB - Megabyte, or 1,024 KiloBytes, or 1,024 times 1,024 bytes. Nowadays, computer memory is often so large that it is measured in MB rather than Bytes.

MENU - A list of items on the screen, from which you are invited by the computer to choose one or more of those items.

MHz - megaHertz, a measure of the number of cycles per second.

MINERVA - A replacement operating system chip for the QL. The original versions of the QDOS operating system for the QL did have a few problems which were not sorted out before the QL was discontinued. Minerva is produced by TF Services, and fixes these problems and provides a few extra facilities as well.

MODEM - MOdulator/DEModulator.

MP - Multi Processing

MSB - Most Significant Byte, the top 8 bits of a number (the leftmost part when written as a binary string).

MT - Multi Tasking.

NLQ - Near Letter Quality, a term used to describe print quality.

OEM - Original Equipment Manufacturer.

OS - Operating System, the program or collection of routines that controls the computer.

PAL - Programmable Array Logic, a type of logic chip.

PAR - abbreviation used to represent a parallel printer port, sometimes known as a Centronics compatible printer port. On an original QL, you'd tell programs to print to SER1 or SER2. If you use the printer port on a Super Gold Card, or on a PC fitted with a QXL or QPC emulator, it will usually have the name PAR as far as the QL system is concerned, so you'd tell programs to print to PAR instead of SER1, for example. A parallel port differs from a serial port in that it can send several bits of information down a cable at the same time (usually 8) rather than 1 at a time as would be the case with a serial port. Printing via a parallel port would usually be faster than to a serial port, but the disadvantages could be that (a) cables have to be shorter than serial links for reliability, and (b) information can usually only go out from the computer to whatever is connected, you cannot get much information back, so you couldn't connect two computers together to share information via the parallel port on a Super Gold Card, for example.

PCB - Printed Circuit Board.

PCL - Printer Control Language, a Hewlett Packard system for controlling printers. There are various levels of this, up to level 5, and commonly used with laser printers. Also used

to some degree by Deskjet and similar inkjet printers.

PD - Public Domain.

PSU - Power Supply Unit.

PTR_GEN - The pointer interface for the QL's windowing system. PTR_GEN is responsible for controlling a mouse pointer on the screen and for saving and restoring the contents of program windows as you switch between programs with CTRL-C (see above). PTR_GEN is supplied with most pointer environment programs, such as QPac2.

QDOS - QL Drive Operating System or QL Disk Operating System. This is the operating system of the QL, which is basically what makes it tick. QDOS is responsible for starting up the QL when you switch it on, and provides the necessary code and routines to let you do anything from printing to the screen to multi-tasking your programs.

QLay - A freeware QL emulator program for Windows 95, DOS and Linux based systems. Allows these machines to run QL software, and can be downloaded free from the Web site <http://www.winter.nl.net/hcc/A.JawVenema>

QPAC - QL Pointer Accessories. Either of two packages produced by Tony Tebby to enhance what you can do with your QL. QPac1 gave you a number of small but useful programs such as a calculator and typewriter and alarm clock, while QPac2 gives you a file handling menu, buttons and all sorts of utilities to help you with the multi-tasking and windowing system on the QL.

QPC - QL on PC, a commercial program which allows a PC to run QL software by making the PC pretend to be a QL as far as the software is concerned.

QRAM - Predecessor to QPac2, a collection of menus and utilities vaguely along the lines of QPac2. QRAM is no longer available.

QTYP - QL Typing checker, from Tony Tebby.

QVME - A graphics card available for the Atari ST QL emulator. VME stands for Versa Module Europe, enabling a card size called Eurocard to be used on 68000 based computer systems such as Ataris.

QXL - A card which plugs into an ISA (Industry Standard Architecture) slot on a PC, allowing it to run QL software much faster than an original QL. I have no idea what the X stands for - probably implying extended QL or something like that.

RAM - Random Access Memory, the memory used in the QL. You can read information from

and write information to this type of computer memory.

RAMDISK - A QL device for storing information in memory in a manner broadly similar to a floppy disk or microdrive cartridge. Fast, but contents lost when you switch off or reset the QL. Useful for copying files to temporarily on a single drive computer, for example.

RGB - Red, Green, Blue. Three components of a colour video monitor signal.

ROM - Read Only Memory, or memory which you can only read information from. Once information has been programmed into this type of memory, that's it, it can't be changed. The QL's operating system, a program or collection of small utilities which determines how the QL starts up and operates, is stored in this type of memory.

RS232C - I don't know what the letters stand for, but basically this is the name of the system used for sending data 1 bit at a time down a serial link such as the SER1 or SER2 sockets on the QL.

RTC - Real Time Clock.

RTM or **RTFM**. Something a trader or programmer is likely to tell you when you haven't read the instructions. Stands for Read The Manual, but I'll let you guess what the F in the second version stands for.

RTS - Request To Send, an RS232C signal pin.

R/W - Read/Write. Getting information from or sending information to something.

SB - SuperBASIC

SBASIC - An enhanced version of the QL's SuperBASIC, supplied with the SMSQ operating system.

SCR - Screen window. A type of window on the display where you can PRINT information to. SCR windows have no keyboard facility, so you cannot use the INPUT command to allow the user to enter any information in that type of window.

SGC - Super Gold Card.

SER - One of the serial ports on a QL. This is the name by which these sockets on your computer are known to the computer and to the software it runs. On a PC, the sockets might be called COM1: or COM2:, but the QL emulators such as QPC and QXL always refer to them as SER1 or SER2. SER is an abbreviation for SERIAL, which means that every bit of information sent to these ports is sent one after the other, in serial fashion, rather than say 8 bits at a time. See PAR above.

Professional & Graphical Software

ProWesS

ProWesS is a new user environment for the QL. ProWesS is short for "PROGS Window Manager", but it is much more than that. Apart from a new window manager, it contains all the system extensions from PROGS, and is essential if you want to run programs which need these extensions.

The ProWesS reader is a major part of the package. It is a hypertext document browser. This means that text files which include formatting commands (including pictures) and possibly links to other files can be displayed and read in this program. This is used in ProWesS to read (and possibly print) the manuals, and display the help files. The hypertext documents which are used by the ProWesS reader are in HTML format, the format which is popular on Internet to display World Wide Web pages.

Another important aspect of ProWesS is the possibility to allow programs to automatically install themselves on your system, and to be able to run them without resetting the system. This means that, when you get a new program, all you have to do is insert the disk and indicate "start the program in flp1", a menu option in the "utilities" button. To install a program, you indicate "install software", and the software can be added to your system. This way, you don't need to know how to write a boot file to use the multi-tasking capabilities of your computer.

ProWesS includes many programming libraries. These include syslib, an interface to the operating system, PROforma, a vector graphics system, allowing rendering both on screen and on paper (via a printer driver). The DATAdesign engine is also part of ProWesS. It is a relational database system with a bonus, as you don't even need a key field. You get a powerful record at a time data manipulation extension to the language you already use. Of course it also includes ProWesS itself, the new resolution independent window manager.

PFlist

Easy to use program to create listings on any printer (especially inkjet and laser). This ProWesS application allows you to indicate the files which have to be printed. Each column contains a footer which can include the filename and filedate. The listings always allow perforation. PFlist can create your listings in two columns and in landscape (or both).

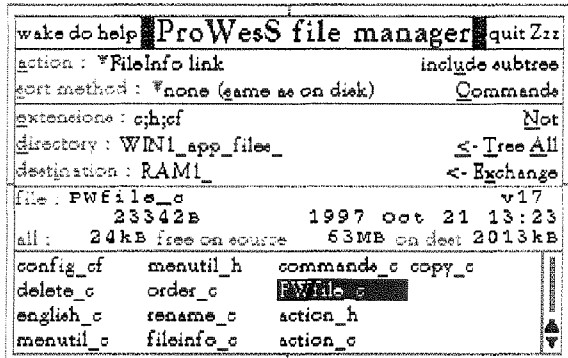
fsearch

File search utility with many useful options, like the choice to search only files with a certain extension, and whether or not the directory tree has to be scanned. All occurrences of the searchstring will be displayed with line number or offset. You can also use special matching features, like case dependent, matching a space with a stretch of whitespace, and searching for a word delimited string.

font- utils

manage your font collection. You can preview fonts on screen, see what characters exist in a font and convert Adobe Type 1 and similar fonts for use in ProWesS.

*New ProWesS application
a powerful and very user
friendly file manager*



LINEdesign

Create artistic drawings, technical drawings, process bitmaps (even scale and rotate them!), and any kind of vector drawings. You can use graphics objects to create the most fabulous drawings ever seen. Because LINEdesign is a vector drawing program, any part of the picture can be moved, scaled, rotated, slanted without any loss of precision or resolution. In LINEdesign, pictures are device independent, meaning that the printout will be the same on any printer (e.g. same size and position).

LINEdesign is good at handling text. You can easily put titles and full paragraphs on the page. All the fonts can be displayed at any size, rotation, etc. All the fonts which are available to ProWesS can be used in LINEdesign.

LINEdesign is a drawing program, but it can also be used by people who are not good at drawing. LINEdesign is a great program for making leaflets, posters, and any kind of printed work. Lots of clipart and extra fonts are available from public domain libraries and BBS's. You can even import Adobe Illustrator files.

DATAdesign

Never before has it been so easy to create, fill in and maintain your personal databases. To start a new file, just type the names of the fields. To add or delete a field, no problem, just do it. To change the name of a field, just indicate it. You can choose which fields are displayed and also which records. You can have a hidden comment for each record, look at the file in tabulated form and transfer data to the scrap or hotkey buffer. Files can be memory based (for speed) or disk based (for safety).

new address !!

Dr. Fr. Hemerijckxlaan 13 / 1
2650 Edegem
Belgium

tel : +32 (0)3/ 457 84 88
fax : +32 (0)3/ 458 62 07
email : joachim@club.innet.be
www : <http://www.club.innet.be/~year2827>

ProWesS - BEF 2400

DATAdesign - BEF 1200

PWfile - BEF 900

PFlist - BEF 600

Payment terms :

LINEdesign - BEF 1200

fontutils - BEF 1200

fsearch - BEF 600

You have to run ProWesS to make LINEdesign, DATAdesign, fsearch, fontutils and PFlist work (even though DATAdesign uses wman).

All our software is normally supplied on high density (HD) disks. However they can be obtained on double density (DD) disks at an extra costs of BEF 100. To use ProWesS and any of our other packages, you need a system with at least 2MB of memory. You should have a harddisk although a two disk system will also work. The use of SMSQ/E is strongly recommended for optimal use of ProWesS.

If you are VAT registered (specify registration number) or live outside the EEC, the amount to be paid is the total (including postage) divided by 1.21 (no need to pay too much).

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BYTS OF WOOD

SAW POINTS OFFCUTS AND SNIPPETS

by Roy Wood

I have been involved in writing things for QL magazines ever since Bob Dyl phoned me up in 1994 and persuaded me that I should do something for IQLR. I have always enjoyed the challenge of trying to produce something which was both informative and entertaining and I hope that I have succeeded in doing that to some degree. Since that time I wound up becoming a trader and launching Q Branch which effectively shut me out from the role of reviewer and I have had to find other things to write about. One of the things that happens as a result of the daily running of Q Branch is that people give me all sorts of snippets of information and ask all sorts of questions, some of which I would very much like to pass on to a more general audience. This, somewhat lengthy preamble, leads me to the genesis of 'Byts of Wood' I hope to be able to produce a regular column, of which this is the first, which will pass on the helpful, ridiculous or otherwise scurrilous things that come to me during the course of the preceding two months. A kind of 'everyday story of QL'ing folk'. I am sure that our illustrious authors will blue pencil the more slanderous, disparaging or otherwise denigrating (thank you for the Thesaurus Geoff) comments that I may make and also correct some of the mistakes that my lack of expert knowledge may lead me to make. I hope that there will be more than a few lines of text left at the end of this process to put into the magazine.

Net This

For those of you who have access to the internet and have not yet picked up on one of the liveliest QL areas around try emailing the following address: ql.users@nvg.ntnu.no with the word 'subscribe' as the subject. This should put you onto the QL Users newsgroup. If you have a good provider you can put the output of this into a newsgroup pigeon hole. This is a very

spirited and occasionally funny free for all about many different subjects. It veers off into the highly technical at times but it is often very informative so check it out.

Aurora - I Thought I Saw the Light

It was the above mentioned newsgroup which led me to what I thought was a blinding flash of understanding recently over the Aurora serial ports. One of the things that I did with my old QL / Super Gold Card / SuperHermes set up was to connect my Psion series 3a to SER 1 and transfer text and programs downloaded from the Psion User Group Bulletin Board backwards and forwards. It took me some time to work out the correct wiring for the plugs and inspired an article in Volume 1 of this magazine. Then I got an Aurora. All communication stopped. Was my Psion jealous of the new wide screen? Was it sulking? I consulted several luminaries on this subject all of which either denied there was a problem (the 'works OK on my system' syndrome) or said that they had experienced a problem but did not know what the answer was. At the end of November a message appeared in the newsgroup asking why they could not use QTPI and SERmouse on SER 1 and SER 2 respectively. Many replies ensued from Nasta and a whole host of other people. I thought 'this is my chance' and slung in my question about why my two systems were not talking. I logged on again to send the message and there was another answer from Tony Firshman about how the two ports had some common connections and so the mouse movements got muddled up into the comms signals and how the handshaking was not common. PING! I remembered something Jochen told me about a friend of his who said that the two ports were wired the wrong way round. I was talking about handshaking at the time and I thought that he meant that, as on the QL, the two ports were wired with the handshaking lines reversed. Since I knew that the Aurora ports were both wired the same I thought this

was not the answer. I then decided to swap the cables over between SER1 and SER2. I could not just plug into the other port because I had a 9 pin D plug on SER 1 and a 25 pin D plug on SER 2. Having swapped the plugs over and I had immediate communications! This solution is, it seems, not good for everyone. Dennis Smith called me to say that it did not work for him and I am still not sure if I had plugged them in round the wrong way to start with. Q Branch runs off my Aurora and I have not had the time recently to take the thing apart and check it out. Tony Firshman is delving deeper into the complexity of the serial ports and Nastasic says he is doing an article on Serial ports for this magazine - watch these pages for more details....Well it is a serial.

Portishead Re-Visited

The end of November saw another Portishead show. As usual it was a very enjoyable affair and this time Henry Orlowsky managed to restrain himself from last years impersonation of a Radio 1 DJ which meant that we could hear what other people were saying to us. These shows often demonstrate why I enjoy being part of the QL community so much and this one was no exception.

I had recently been playing around with Jonathan Hudson's Qascade program and, since he was there I mentioned to him that it would be nice if I could include the HOTKEYS into Qascade menus as well. I set up several different QDs on HOTKEYS all of which have different purposes. I also LRESPR DATA design and use hotkey to pass the name of specific databases so that the program appears with the database ready for use. Jonathan modified the program there and then so I left with a new version doing exactly what I wanted. Two days later another thought occurred to me and I emailed him to suggest that he made it FileInfo 2 compliant. The idea being that if you had files which were constantly updated you could just put the filename into the menu and let FileInfo 2 do all the work of loading the program. The next day back came a copy of Qascade (v1.07) which did just that. You don't get that kind of stuff with a PC.

FileInfo 2 and Qascade are two of the most useful and clever pieces of free code that are available for QDOS/SMSQ users and well justify keeping an eye on the bulletin boards and the

various software libraries. Hats off to both Jonathan Hudson and Thierry Godefroy for their sterling work !

Hove Into View

Once the Christmas and New Year celebrations are over I and the other members of the Sussex User Group will be getting down to some serious organisation for the Brighton / Hove Quanta workshop. This will be my third year of doing this and we are returning to the same hotel (The Excelsior) as last year (hopefully, if Jochen can actually come to it, he won't fall down the stairs again) [**If YOU make sure it does not rain again - Jochen**]. We had a good show there last year and I am hoping the same good attendance will be repeated this year. There are many new projects waiting in the wings for us in the coming months and I hope that we can bring some news of them at the show. Hardware is very much to the fore this year with the ROM-Disq, the Gold Fire and the possibility of the new Q40. It is a bit disappointing that Miracle will not now be making the Ultra Gold Card since we will need all the speed that we can get when the new word processors arrive but the extra memory that will be available on the Gold Fire will go part of the way towards making up for that. Software developments are not being left behind, however. Although Wolfgang Lerner's ProWesS based wordprocessor is still under development the first stages of it, which I saw being demonstrated at Eindhoven in November, look very promising indeed. The colour printer drivers which enable LINEdesign users who have the Epson Stylus Colour, Colour 200 or Colour 600 range of printers to produce coloured prints are very impressive (go onto PROGS website or send a formatted disk and postage to Q Branch). Other colour drivers will be developed when possible. As a final word to those who think that the PC has it all going for it I would like to point to something which I read in the user manual for the Epson Stylus 600. In the section on installation it gives the minimum specifications for the computer on which to install the driver. It quotes 8Meg of RAM as a minimum and gives 16 Meg as recommended. And this is just a printer driver!

■

After publishing a number of reviews of some of the wide range of PD/Freeware software available for the QL, and seen the positive reaction to our PD scene coverage, we have decided to launch a 'PD Pinboard' service to keep readers aware of developments on the PD scene.

Like the cork variety of a pinboard, we foresee authors of PD/Freeware software sending us brief news of new releases or updated versions, including version numbers and brief details of significant changes or bug fixes in their software.

Obviously, this service can only really work with the co-operation of software authors and others who are willing to send us the news, so we hope it will be well supported for the benefit of the QL scene as a whole.

Finding the right PEG ...

Darren D. Branagh

I thought for this particular software review that it would be fun to take Jochen's article on E-Mail Shortcuts, and Internet Abbreviations (Vol. 2, Iss. 3) a step further - so for this article, I decided to create my own one - PEG.

PEG stands for "Pointer Environment Game", so over the next few paragraphs I will be looking at some of the wonderful PEG's available in the Public Domain!!

For the benefit of everyone who reads this, I have decided to give each game reviewed a score out of 10 under a number of headings - namely Graphics, Playability, Addictiveness, and an Overall mark (Please let us know what you think of this method - and I will do it on all future reviews if it is liked.)

Alright - now on with the Games. I Will be looking at Five (value for money or what!) - Crazy Cards, Minefield, Einstein, 23 Bullets, and Puzzel.

CRAZY CARDS

The first thing I noticed about crazy cards are the graphics - they're excellent. Bright and colourful, the cards are easily recognizable. On the down side, the game suffers from being written in German, with German instructions, so It took some time, and trial and error to discover how to play it.

The idea of the game is to make the cards "Run" - i.e. sort them Ace to King, as in Patience, or Solitaire (quite popular on those PC things under Windoze.) You have 4 Chances to do this, and to move a card place the cursor on a blank (i.e. you have say, a 6 with 3 blanks after it - simply place the 7, 8, and 9 in the blanks by using HIT on the mouse (or the SPACE key), and any move can be reversed using DO (ENTER). Simple!

GRAPHICS: Very Good and Sharp, much larger than in the LONELY JOKER, but not as intricate.

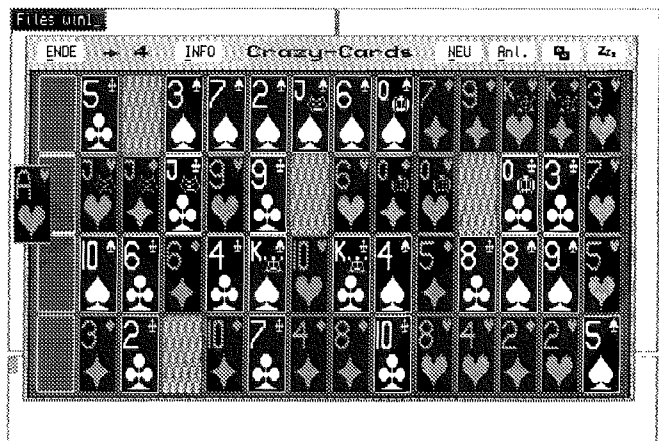
MARK 9/10

PLAYABILITY: Let down by the lack of English instructions, (German ones can be called up from within the Program) but easy to discover by trial - Not Bad. **MARK 6/10**

ADDICTIVENESS: Not as addictive as the lonely Joker, but it has more variety than this.

MARK 7/10

OVERALL: Quite a good game. **MARK 8/10**



MINEFIELD

Any of you that own a PC will be familiar with this one. Called Minesweeper on a PC (in Windows 3.1 and 95) it is quite popular. Jochen Merz sells a commercial version of this game, but it is the new PD version I am concentrating on.

The object of the game is simple. You must locate a certain number of Bombs that are hidden in a grid, by clicking on squares to remove them. When a number is revealed in a square, that indicates the number of bombs in the immediate 8 squares surrounding it. Using simple deduction, it is easy to know (after some thought) which squares to remove and which contain the bombs - or thats the theory - It can be quite difficult!!

sinclair

Z88

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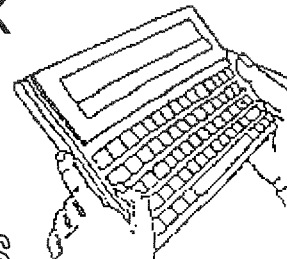
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This game is very similar to the PC version - but the icons used (especially the large skull and crossbones your pointer becomes when you uncover a bomb and blow yourself up by mistake) are very well done, and altogether better than the PC version. The QL version does lack the ability to define the grid to any size, but this is a minor point (I don't know about the QL commercial version.) The instructions file that accompanies this game is also well written.

GRAPHICS: Excellent, couldn't be much better for this sort of game. **MARKS: 8/10**

PLAYABILITY: Easy to get into, and control is perfect. **MARKS: 9/10**

ADDICTIVENESS: you'll be playing this in your sleep!! **MARKS: 9/10**

OVERALL: Already a PC classic - should be the same on the QL. **MARKS: 9/10**

EINSTEIN

Einstein, as it is imaginatively called, is a simple game based on colours. The idea is to change all the squares on the board to the indicated colour by clicking them - sound simple? Well, it isn't!! It's really addictive, and I spent hours at it before I got past the first level (mind you, I was in the same boat instructions - wise as Crazy Cards above - it's by the same Author!)

It's so simple to learn yet so hard to master - That's really all there is to say about Einstein (I loved it.)

GRAPHICS: As it's based on blocks of Colour, there aren't really any graphics to comment on.

PLAYABILITY: Quick and easy - point and click. **MARKS: 9/10**

ADDICTIVENESS: Quite addictive, but gets repetitive after a while. **MARKS: 7/10**

OVERALL: Not a bad game at all. **MARKS: 7/10**

23 BULLETS

Anyone ever played NIM? 23 Bullets is loosely based on it, and the idea of the game is this : on the screen you are presented with 23 balls, or bullets. You or the QL can opt to go first, and the idea is to remove any combination of 1, 2, or 3 bullets in turns, in order to force your oponent to take the last remaining bullet. This is another game that sounds simple, and is - until you try to win!!

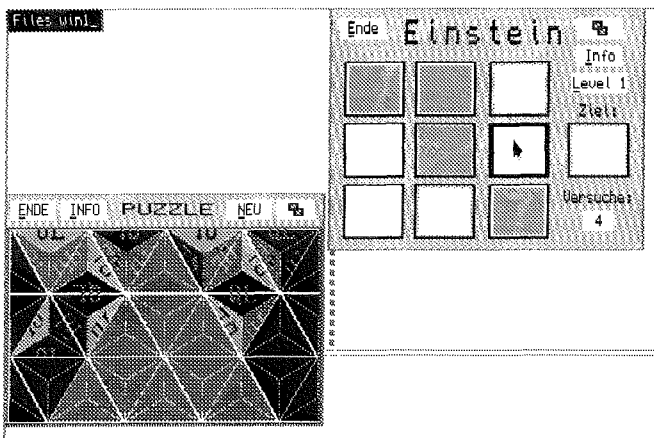
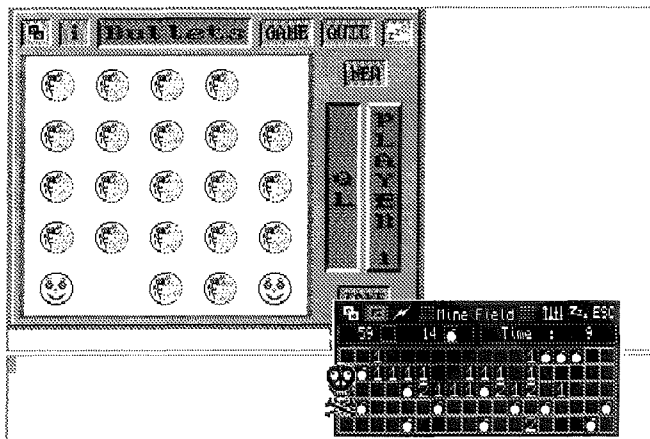
I played for THREE HOURS solid before I won a match against the QL (though you also have a 2 player option to play against a friend) !! This is a brilliant game, probably my favourite at the moment. The graphics are excellent and game-play is fast and sharp. I really like this one.

GRAPHICS: Brilliant, very colourful. **MARKS: 10/10**

PLAYABILITY: No Instructions (German), but easy to pick up and I was playing in a few minutes. **MARKS: 8/10**

ADDICTIVENESS: Totally addictive, its great! **MARKS: 10/10**

OVERALL: A very well programmed, entertaining game. **MARKS: 10/10**



PUZZLE

Another Puzzle game (hence the name - deliberate misspelling! *Ino, German spelling! [Editor!]*) Instead of squares for a change, you are given an amount of triangles, within a larger triangle. The idea is to reassemble the triangle using the smaller triangles as pieces to the puzzle. One snag - you must keep the pattern and the colours on the edges of each triangle matching with the next one. You can revolve the triangles to a new position to aid you (using HIT), before you place them down (Using DO).

The geometrical graphics of Puzzel appealed to me, and I liked the game too, although I haven't beaten it (yet).

GRAPHICS: Geometrical Triangles, good use of colour. **MARKS:** 9/10

PLAYABILITY: Easy to get into, but no english (again!) **MARKS:** 8/10

ADDICTIVENESS: Quite Addictive, I am still trying! **MARKS:** 8/10

OVERALL: A good version of the "Jigsaw" Puzzle. **MARKS:** 8/10

OK, I want them - where do I get 'em?

If you want to get hold of the above PEG's, Crazy Cards, Einstein, and Puzzel are available from Steve Johnson on Disk SJPD 63, or Einstein only from Qubbesoft P/D on PD16. 23 Bullets from Steve Johnson on SJPD 71, Minefield from Qubbesoft P/D on disk number PD15, along with various other good programs on all these disks.

So, there it is. I hope this review will encourage more of you to try out some of the really good games available on the QL in the Pointer Environment as I have done, they are really worthwhile, and provide a lighter side to QL'ing. Now I'm off to load up Puzzel and see if I can win this time!!

CIA World Factbook 1996

Dilwyn Jones

Following on from Darren Branagh's review in Vol. 2 issue 1 of QL Today of the QL port of the Project Gutenberg release of the 1994 CIA World Factbook, by the time you read this I will have completed the QL port of the 1996 data version, using data downloaded from the 2nd July 1997 version on the Factbook Web site. It will be available from PD libraries and in due course Quanta library. The original file was GNU-zipped and I would like to acknowledge help given by Dave Walker to decode this file format which I was unfamiliar with.

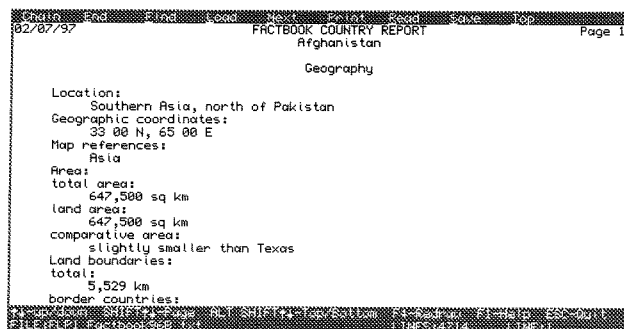
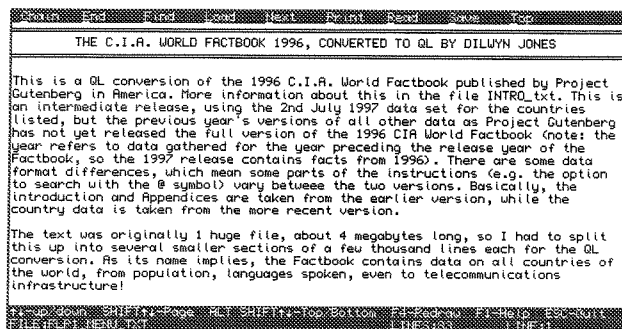
FAIRY TALES

Parents with young children (like me) will probably enjoy my other contribution to the PD scene recently. I converted the Project Guten-

berg edition of the Colour Fairy Books, all 4 editions, and added a QL text file viewer. The converted files have been sent to Steve Johnson and so dozens of fairy tales will be available on the QL for our children.

Text File Viewer

Following on from work on the above conversions and also suggestions from Barry Ansell, by the time you read this version 1.15 of my text file viewer program should be available. Recent changes include fixing of a bug in the Next command, addition of a fast word find (place cursor on a word and press F5 to search for next occurrence of that word) and the facility to suppress the "Quit Y/N?" query on pressing ESC to quit, making the Viewer easier to use for displaying help text files from within other applications. Also added is the facility to pass some parameters in the option command string parameter after an EX command to allow data such as startup origin co-ordinates and display size to be specified, and you can also specify a line number within the text where the cursor will be positioned after loading the text file, again useful for positioning the cursor at an appropriate point in a Help text file, for example. Unfortunately, after all the recent changes and additions to this program it no longer works on an unexpanded QL.



Qascade - A Review

Timothy Swenson

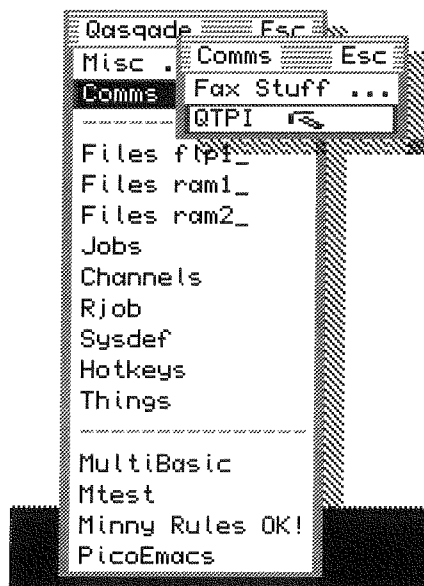
Qascade (pronounced 'Cascade') is the latest freeware utility from Jonathan Hudson. Qascade is a user-defined menu system, not unlike the "Start" button in Windows95. Qascade gets its name because a menu can have submenus, which can have submenus, and so on, looking as if the menus cascade from each other. The only requirements for Qascade are the Pointer Environment and Environment Variable (env_bin) support.

Qascade allows the user to totally define the menu structure. A menu item consists of either a selectable item or a submenu.



Each submenu also consists of selectable items or submenus. This can continue until you either run out of memory or screen. Selectable items are selections that execute programs, Things, Mbasic or SBasic programs.

When Qascade is executed it appears as a button. When you select the button, the main menu pops up. From there you can select a menu item, or select a submenu. When you select a submenu, it pops up, a little lower and to the right of the main menu. This continues on until you find the selection you want.



The purpose of Qascade is to provide a single menu system that can replace one or more other menu systems. It can be used as a primary user interface for the QL. One could run all of their QL programs straight from the Qascade menu system.

The flexibility of Qascade comes from a configuration (_rc) file. This file defines what the menu items are and what programs they will execute. This file is read when Qascade is executed. You can also force Qascade to reload the

file by hitting ESC when you have the mouse cursor over the Qascade button. This way if you change the _rc file you don't need to re-execute Qascade. You can name the file whatever you want, meaning you could have more than one file. Qascade knows what the file name is through an environment variable. You set the variable with a command like:

```
setenv "QASCADE_RC=flp1_qascade_rc"
```

Capitalization on QASCADE_RC is important and needed. You can either type this command in each time you execute Qascade, or you can put it in a BOOT file.

The structure of the RC file is defined as:
keyTAB**menu_text**TAB**action**TAB**paramaters**

Key is one of the following:

- EXEC** - Start an executable program
- ETHG** - Start an executable Thing
- MBAS** - Start a MultiBASIC session
- SBAS** - Start an SBASIC session
- TITLE** - Define a new menu title
- MENU** - Start a sub-menu section
- MEND** - End a sub-menu section
- SEP** - Draw a separator line

Menu_text is your description of the menu item.

Action is the program to run (like QED, Xchange, etc.). **Paramaters** is the command line options that you would normally put after a command (like

EXEC ZIP;"-x"). Any line that starts with a number (#) sign is considered a comment. A very simple menu configuration file would be this:

```
#Very Simple Menu _rc File
EXEC Xchange flp1_xchange
SEP
TITLE Games
MENU Games
EXEC Pente pente
EXEC MineField Minefield
MEND
```

Remember that there have to be TAB characters (CHR\$ code 9) between the words. You must use a text editor that will put in the TAB character and not just a number of spaces. Metacomco's ED does not work. QED will support TABs when read in, but when typing, TABs are converted to spaces. I have not tried Quill, or MicroEmacs, or Elvis (a vi clone), or others. The use of TABs might be the weakest part of Qascade, considering that TABs are non-printing QL characters. I would have used something like a colon (standard for Unix systems).

Noticed that for Xchange I explicitly defined what device to find Xchange on. For the other programs where I did not explicitly define the device, Qascade will use PROG_USE and DATA_USE to find files.

Qascade has been tested on QDOS and SMS systems. Additional testing is needed to make sure that Qascade runs on all QDOS-based platforms. Jonathan is very quick to fix any problems that come along.

The basic summary of Qascade is that it works. It is not overly complex. It's simplicity makes it very powerful. I'm not one for using operating systems front ends, but I like Qascade. I have done something similar with SuperBASIC and QMENU extensions, but I would have to alter the code every time I wanted to add another program. With Qascade, you don't have to touch any code, just edit a file. I think once QLers try Qascade, it will become very popular.

■

CD Player V1.02

Dilwyn Jones

Back in Vol 1 Issue _ of QL Today, I predicted there's soon be a glut of CD player programs for QPC users. I was wrong, there are a few, but this is one of the better ones I've seen. It's written by Andrea Carpi of Vercelli, Italy, and released by Beginners CLub (Italy). This program can be found in many PD libraries and bulletin board systems. The program is Post-card-ware - the author asks you to send a post-card if you find the program useful (which I did).

Most QPC users will have used the CDplayer.bas program supplied with QPC to play audio CD disks. This remarkable little basic

program does have its limitations - it is not pointer driven and cannot be moved around the screen.

CD Player v1.02 was written in May 1997 using EasyPtr, and compiled with QLiberator. The program appears to be well error trapped, and is quite easy to use. I have used it on a Pentium PC with an IDE CD-ROM and Windows 95, and on a notebook computer also running Windows 95, but this time with a Backpack parallel port CD-ROM. I didn't expect this latter combination to work, as the notebook PC had no proper sound card. The CD-ROM drive had headphone outputs, to which I connected a pair of tiny 4 ohm speakers of the type used with Walkman-type CD players, and amazingly it worked. This shows that the ability of the QPC extensions to control the CD drive does not necessarily depend on having a sound card, though obviously if the CD-ROM drive has no audio output of its own, this is rather pointless. The CD Player program runs in 4 colour mode, on all display sizes.

The instructions consist of just one page of plain text file, listing copyright details, files supplied and how to start the program. QPC, QPAC2 (not sure why QPAC2) and Toolkit 2 are required for this program to work.

A built in configuration block lets you tell the program where to find its own files - in addition to the program itself, it needs to know where to find the job which updates the display and a digital (LED or LCD) style display. As an alternative to configuration with the standard CONFIG program, you can pass the name of the drive/directory where CD Player's files are stored as a parameter in an EX command:

```
EX WIN1_CD_CDplayer_obj; 'WIN1_CD_'
```

Two versions of the program are supplied - one with the QLiberator compiler runtimes attached for people who do not have the qlib_run file from QLiberator, and the other slightly shorter version without this file attached for people like me who have the compiler extensions resident all the time.

When the program starts, it looks just like the front panel of a typical CD player machine. On the left of the digital display are three buttons, one a standard pointer environment move icon (though it doesn't respond to CTRL F4 in the usual fashion) controlling where on the screen

CD Player lies (useful with large displays, you can move it to an unused part of the screen), the next is a standard Zzz icon, allowing you to zap the program into a button in the button frame (the audio carries on playing, though obviously you don't then get a time and track number display), and the bottom one is like the on/off switch on a normal CD player, HITting this just removes the program altogether.

The main display itself shows track and CD details - track length, time to end of CD., track number playing, and so on (see the screen dumps). The numbers are displayed in an LED-style green font, which looks very like the 7-segment displays used on a conventional CD machine.



To the right of the time display window is a set of eight buttons duplicating the transport control on a conventional CD player - Play, Pause, Stop, Eject, Next track, Previous track, fast forward and rewind.

HITting the 'CD-Player' icon brings up a copyright screen, and at this point there is a minor bug - how do you get out of it? Actually, clicking on OK gets you out of it, but until you move the pointer over it, you could be forgiven for not noticing it is actually a selectable loose item. The CD keeps playing during all this.

There appears to be no way to specify the CD-ROM driver name (as in QPC's CD_INIT command), unless you're intended to issue a CD_INIT command before starting CD Player. You can't pass a parameter to it in an EX command to specify this, as you can with CDplayer.bas, but it seems to work anyway. Recent versions of QPC allow you to configure the default CD driver name (e.g. 'Mscd001') into SMSQE.bin, so the program probably responds to this anyhow. As I haven't got an older copy of QPC before this feature was introduced, I can't test the program to see if it would fail on earlier versions of QPC. If it does, just get Jochen Merz to update your copy of QPC in the normal way.



In use, some of the transport controls sometimes take a while to respond, but CDPlayer.bas

from QPC and the SBASIC extensions of QPC all seem to be able to exhibit this problem, so I guess it's probably not a problem in CD Player v1.02, although it can be a bit tedious, for example when trying to skip forward half a dozen tracks by HITting the SKIP FORWARD button a few times because nothing seems to be happening, then it catches up and you find you've skipped too many tracks. Also, rewinding and fast forward aren't really clean in the sense that they just jump a few seconds at a time rather than continuously playing at a different

pitch or faster as a tape recorder would do. Looking at the CDplayer.bas program of QPC, there is a reason why this happens, so I

guess this program must use a similar programming technique. No great problem once you get used to it, but it's a bit disconcerting at first!

That's it really, there's not all that much to this program, it sets out to be a straightforward audio CD player for QPC and succeeds in my mind. It has no frills - no PROGRAM mode to specify a list of favourite tracks to play; no REPEAT button to loop around single tracks, all the CD or a list of tracks; no SHUFFLE button to randomly mix up the tracks so you don't get tired of a particular CD when you've got so used to it you remember which track comes

next all the time; and no SCAN facility to hear a few seconds from the beginning of each track. I work in the audio

industry and am used to these facilities, but for the average home users, I doubt if most of them would be missed. Still, the next audio CD player to be written should include these features for me, please!

Excuse me, I liked the program so much I'm off to send a postcard to Italy! Between this and Screen Viewer, I've become quite a fan of Beginners' Club software.

■

JOSHEW MERZ SOFTWARE

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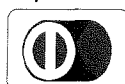
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Quanta Library Software Review

PD Pointer Programs

Darren Branagh

I am currently trying to learn to use the Pointer Environment. Having used Windoze 3.1 for years at work, and therefore being no stranger to mice, I am currently struggling with QPAC2, getting help here and there, and was hoping it would be easy - and it is, up to a point (no pun intended!). However, imagine my delight when I found out an entire suite of Pointer environment programs had been written by Phil Borman some

time ago, and placed in the QUANTA library - Free, Gratis and even for nothing! (Getting a bit of a habit this - me reviewing PD software, really I do buy the odd bit too, you know!!)

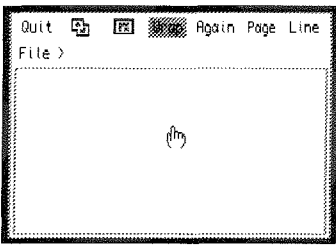
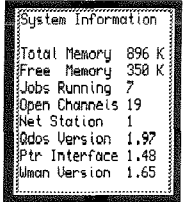
Anyway, there are several of these programs, and together they are a very powerful and useful set of tools. The first thing I'll say is that the P.E. itself (namely the files Ptr_gen, Wman, and Hot_Rext) are NOT PD - they are commercial software, so you must have these already, and have them LRESPR'd before you can use Phil's Pointer suite.

All the programs are loaded using EX or EXEC, and all the files have the extension .EXE. They are:

CHAR: A simple character set generator, which displays the entire character set and is MINERVA specific.



INFO: A useful program that displays the system information, e.g. Total memory of your System,



Memory remaining, the QDOS version, the number of Jobs running, the number of open channels, and the versions of Ptr_Gen and WMAN you are using.

HEXCALC: A useful Hexadecimal, binary, and logical pointer driven Calculator, similar to the one found in QPAC1. This as with some of the other programs, is MINERVA specific, but works on other rom variations too.

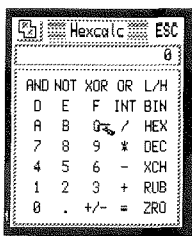
LOAD: This is a fixed data version of the 'HOTJOBS' thing in QPAC2, which stores hotkeys for you, with the data being help in a file called LOAD_TEXT_ASM. It would naturally need modifying for the hotkeys of your particular use.

VIEW: Perhaps the most useful of the suite in my opinion. It is a Pointer Driven file viewer. You can set the window to any size with the Familiar MOVE icon, and the document Page or a Line clicking the buttons. I used instructions to look at the _TXT file that accompanies the Programs, and had no problems at all. It has all the features of a good file viewer, including Word Wrap, which can be set either on or off, by clicking the WRAP icon. A useful Quick N' Dirty alternative to loading up your word processor or whatever.

TREE: This again is very useful if you possess a device driver that supports sub-directories, eg. (Super)Gold Card, QXL, etc. as it scans a given device and displays the directory structure. It also allows you to set the DATA_USE, PROG_USE, and DEST_USE setting easily and effectively, to any sub-directory.

NOTE: Last, and not least, NOTE is a simple pointer notepad, for jotting down information on the go.

So there you are - a very well written brace of progs as far as I'm concerned. My only gripe is that I didn't find out about them long ago. Phil Borman has also gone to the trouble of including the source code to many of these programs on the disk too, to aid would-be pointer programmers, or just the curious. He has also included some user defined sprites for use in your own pointer Programs, and he even apologises for not using some of the features of QPAC2 in them, even though button frames didn't exist when they were written!



If you are starting into the Pointer Environment, or are a seasoned veteran at this stage, the Pointer progs above will be a valuable addition to your software collection. They are available from the QUANTA librarian, on the disk numbered UG04, along with several other useful programs.

About Time

Simon N. Goodwin

I read the 'missing listing' (Clock Trimmer Part 2, QL Today volume 2 issue 1) with interest and noticed bugs which will stop it working on many QL systems. The idea of the Clock Trimmer is excellent, so I have worked out fixes and some potential improvements.

Not content with fiddling with Stuart's program - and hopefully not introducing many extra bugs! - I've waxed lyrical about my favourite subject, time, with some program improvements, observations about SuperBASIC, compilers and interpreters, flying, broadcasting and the Internet. I hope the results will make interesting reading even if your clock already keeps perfect time or you couldn't care less about date and time stamps as long as your latest files have greater dates.

Returning to Stuart's BASIC, I spotted some dependencies which mean it probably works fine on his system, but will not on Sinclair and CST systems which run the original SuperBASIC interpreter. These raise some interesting points about compatibility, revealing that while SBASIC should run most if not all existing SuperBASIC, the reverse is not true. Still, that's the price of progress, and as long as the changes are well known - and not just to SMS customers - needless hair loss can be avoided.

The most obvious problem is in lines 1330 and 1340, where DIV and MOD are used to split a 32 bit number into two 16 bit halves. This does not work on QL ROMs, including Minerva 1.93, because DIV and MOD were defined by Sinclair as integer operators - hence restricted to a 16 bit range of -32768 to 32767 for both operands. In fact Sinclair ROMs have trouble with -32768 as well, because it 'inverts' to the same value in 16 bit maths, unless you check for the overflow. This bug was fixed in Minerva and Thor XVI ROMs, but the 16 bit limitation remains.

FIRST BUG

I guess that Stuart was using SBASIC, and one of its 'improvements' surreptitiously re-specifies DIV and MOD to handle 32 bit numbers. This change will upset compilers which optimise the parameters of these operators. Anyway, the solution is simple. If you get an overflow error at line 1330 when you call CheckFileTime, replace the line with:

```
1330 StartTimeHigh=INT(StartTime/65536)
and change the following line to this:
```

```
1340 StartTimeLow=StartTime-StartTimeHigh*65536
```

INT supports the full 32 bit range so you're OK for all possible times. However Qdos 32 bit numbers are signed, so you'll run into trouble in 30-odd years (on or after 19th January 2029) when the 'time' in signed 32 bit arithmetic exceeds the 31 bit positive range.

The easiest solution at this point is to delete the TimeFile and start again; comparisons will work correctly once LastTime and current date are both negative. The clock finally runs out of steam in just under a century, early in the morning of February 6th 2097, when the 32 bit count of seconds wraps back to 1961. I'll cross that bridge when I come to it.

Digital Imprecision

Before I move on to the second bug, it's interesting to note WHY the program splits the time into two 16 bit halves. It's because SuperBASIC (and SBASIC) only print numbers - to the screen or a file - to a precision of seven decimal digits, even though they store more than nine digits internally. Supercharge and Turbo PRINT up to nine digits before resorting to the approximation of exponential notation (1.769412E9 - My Gold Card reckons it's 2017 (eek!) but PRINT only reports the time to the nearest hundred seconds.

This is too vague for the Clock Trimmer, which is why the program writes the exact value in two parts - multiples of 65536 (2^{16}) and the remainder. If this strikes you as inelegant you could use PUT to write the exact, six byte floating point value, and GET to read it back - the program requires Toolkit 2 anyway, as listed - or convert it to and from a string with HEX\$(DATE,32) and HEX(), which preserves all 32 bits but needs a whole eight bytes for the value. I've worked out some POKEs for Amiga Qdos SuperBASIC which let you change the default number of digits output by PRINT to six or eight, rather than seven, but they're only useful if you've got BASIC in RAM and know where to POKE. Check out POKE_DIGITS_BAS on the Amiga Qdos support disk (which is in 720K QL format) if you're curious about this.

Discipline

Anyway, this set me thinking of a possible improvement to the program - rather than require you to run CheckFileTime every week, the program could enforce this discipline by storing an extra value, the time that CheckTime was last run, and calling the procedure automati-

cally when the current time exceeds the last time by 604800 or more - the number of seconds in a week, fact fans. In this case it hardly matters whether you're asked a minute or so early, so the value can be PRINTed and INPUT normally, on the end of the list of values, after CorFactor.

If you do this you'll need to change all the PRINT and INPUT lines to write and read the new LastTime variable, and update it in line 1670 - otherwise re-writing the old value each time.

Second Bug

The second bug is more subtle, and will cause most Qdos systems to crash about 1.5 per cent of the time, other things being random. In practice some people may never see the problem, and others will hit it every time, as it depends on the amount of 'slack space' in the SuperBASIC Name Table when CheckFileTime or CorrectClock are called. Luckily there's a simple fix.

The problem is the otherwise-estimable use of LOCAL to make variables private to the procedures. Sinclair's "AH", "JM" and "JS" ROMs have a bug which means they only allow space in the Name Table for a maximum of nine parameters or local variables. The procedures listed declare ten, each name needs eight bytes, and the space grows in 512 byte steps, so there's a chance of 8/512 that the extra one will be allocated past the end of the table. This is a disaster as it clobbers the start of the subsequent Name List, destroying it so that after that no names can be recognised! The only cure for this situation is to reset the machine.

Go Global

The simple answer is to miss out all of the LOCAL statements, and just remember not to use those names in your main program. In fact two of the ten names do not appear to be used in the procedures, so Sinclair ROM users can just remove the references to Response and SecondsOut, in lines 1130 and 1760, and all will be well.

In fact the string variable Response\$ IS used, but not declared as local, so you might want to declare Response\$(1) if you want really modular code. The only other variable is TimeFile\$, which is global, set outside the procedures. If you make that a parameter you'll overrun the limit of nine parameters or locals, counting Response\$, and trouble could result unless you wrap the procedure in a second dummy procedure which declares some of the LOCALs.

If you're using SBASIC, Thor XVI, MG or Minerva SuperBASICS, the bug is fixed and you can have as many parameters or LOCALs as your heart desires. The same goes for programs compiled with Supercharge or Turbo - in fact this fix is documented in Chapter 6 of the Supercharge manual.

The Listing

The accompanying listing is the Qdos- (and CST Argos/Amiga Qdos) compatible version of Stuart's original. It's designed to be used as a BOOT file or merged with an existing BOOT, so it calls CorrectClock at the start. This then calls CheckTimeFile if it's been more than a week (give or take a few seconds) since the last check. Line 1865 should ensure compatibility with old time files, which do not include the LastTime record which records the previous occasion on which CheckTimeFile was called.

If the end of the time file is reached after reading CorrFactor, this is an old-format file, and LastTime is set to 'now', so you are reminded to tweak the adjustment a week hence. If there is more to be read from the file it's assumed to be a previous LastTime when CheckFileTime was run. If the number of seconds elapsed is more than that in a week (or whatever period you specify in line 1970) a new Check dialogue is invoked.

Babylon 6

The 'week' is expressed here as a number of 60-second minutes times 60 minutes per hour, 24 hours per day and a seven day week. This assumes the Babylonian Earth-centric subdivisions of time. Users on other planets should adjust for their local day, second etc!

More prosaically, the expression on line 1970 should be worked out and inserted as a single number if you want to compile the program with Supercharge or Turbo, or the 'optimiser' will try to do the whole sum with integer arithmetic - normally a time saver, but in this case provoking an overflow. As near as makes no odds, the number of seconds in a week is 604800, fact fans.

I've also added DATE\ to the PRINT in line 1220, so that the current system time is on the screen when you're asked if the current time is correct. Similarly the extra line 1595 shows the time according to the system before you're asked to enter any necessary adjustment. These changes are not needed if you have Toolkit 2's CLOCK task already running by this point.

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Further Tweaks

Once you've run the program for a few weeks you should find that your clock is much more accurate than it used to be, but it will still find irregular discrepancies requiring slight tweaks. The problem is that the frequency of the crystal is not absolutely constant, but varies depending on the temperature of its environment. Years ago I used to fly in aircraft which had little ovens for their radio crystals, which held them at a fixed temperature, higher than any expected in the real world, so that they were always bang on the same frequency - at least to the limits of the thermostatic oven control.

So, if your clock continues to wander unpredictably, you can increase its accuracy - with the aid of Clock Trimmer as there's no reason why it should otherwise stabilise at exactly the right frequency - by running your QL in a controlled environment - say, a fridge (safer than a cooker, but not much more convenient). Alternatively you could upgrade your central heating or air conditioning, although it may be an expensive option.

The true QL tinkerer will already own Tony Firshman's I2C interface, and keep the QL on at all times, allowing a more elegant solution - connect a thermistor, or Tony's ten pound temperature probe, to the I2C analogue interface and track the fluctuations in temperature to compute a further clock-tweaking factor.

Listening Clock

On balance it might be easier to get a clock that listens to broadcast time signals such as Rugby MSF or the German equivalent. Such plug-in clocks can fit in the Amiga parallel port, and I can see no reason why they should not be used on the QL too. Unfortunately Tony tells me that Philips have not produced a radio clock receiver for their I2C bus.

I use these radio clocks in my part-time work as a traffic broadcaster and they're great - especially when the hours go forward or back for GMT or Summer time at the equinox, and they suddenly whizz round to a new hour - but battery and reception problems can trigger this behaviour too, which is bad news when BBC Hereford and Worcester is half a minute late for their dollop of temporary traffic lights and I'm absolutely required to be off-air by 45 seconds to the hour!

Net Time

Since I wrote the above I've found a new and neat way to update the clock on the Amigas I use for most of my Qdos development these days. The Internet incorporates 'Network Time Protocol' which can be accessed from any net-connected system. A simple program decodes the result and passes it to the system, via the Amiga DATE command, or SDATE on a Qdos-compatible system.

The program is written in AREXX, the Amiga version of the REXX language, originally an IBM speciality but now available on many systems - including QL, of course, thanks to Anders Christensen.

The code runs on the Amiga side, and Qdos picks up the time from the system clock when I start the emulator, but there's no theoretical reason - apart from the lack of the Internet connecting software on Qdos - why it should not run entirely on a QL or clone, and the necessary TCP and UDP 'sockets' are now being written in Qdos 68K code by a keen hacker Kresimir Saric in Croatia, according to a report by Graham Underwood on page 18 of the April 1997 issue of Quanta.

Time Script

The following 'script' calls up a time server on the net, which collects the time from various places, corrects for network lag and location (Daylight Saving Time, offset from the Greenwich meridian etc) and returns an up-to-the-second time stamp. The program was written by Robert Grimm and is freely distributable.

In principle the only thing you need to get it running on a QL is to replace the Amiga RX command with an EXEC for the Qdos REXX task, and simplify the date string handling. The Amiga DATE command uses (and expects) month names and 'shorthand' like 'yesterday' and 'tomorrow'.

Qdos is happy with numeric dates and times as stored in REXX variables y, m and d for year month and day, and h, m and s for hours minutes and seconds, so the script can be simplified for SDATE. The whole job could be done in SuperBASIC but the REXX Parse command is a neat way to extract and convert fields from the time server. In the original version the entire program was written in one line, with a bit of parameter checking beforehand, but I've reformatted it for printing here.

Time Check

```
RX "Address command;
If Open(h,'TCP:132.163.135.130/14','R')then;
do;l=Readln(h);l=Readln(h);Call Close(h);End;
Else;do;Say 'Service not present';Exit
10;End;
Parse var l j d t o l; Parse var d y'-m'-'d;
w='JAN FEB MAR APR MAY JUN JUL AUG SEP OCT
NOV DEC';
w=Word(w,m);c=d'-'w'-'y;Address command
'C:Date 'c;
Parse var t h':'m':'s;
If o=50 then h=h+1;h=h+{offset};Select;
When h<0 then;do;h=h+24;c='YESTERDAY ';End;
When h>23 then;do;h=h-24;c='TOMMORROW ';End;
Otherwise c='';End;
c=cllh':'m':'s;Address command 'C:Date
'c;Exit"
```

Internetting

The 'magic number' 'TCP:132.163.135.130/14' is the internet address of a time server. There are lots around - even Demon have one - but I know that this one works. This is the equivalent of a device and file name in Qdos. If the Qdos TCP/IP sockets are implemented in the obvious way, via a new TCP device, we'll use something like:

```
TCP_132_163_135_130p14
```

to achieve the same effect with Qdos name syntax. This seems the easiest way as it allows the use of the normal IONAME routine to parse the IP (Internet Protocol) address into its component parts - four eight bit numbers (at least till the Internet busts through it's current 32 bit

addressing limit) and a port number, here prefixed by the letter 'p'. This is the IP equivalent of a Qdos console name like:

```
CON_448x160x32x40_20
```

- in practice the implementation may be different, as most internet accesses use symbolic names (like my 'domain' studio.co.uk) which are translated into IP numbers by name servers administered by InterNIC. In fact any address can be reached by number or name. Numbers are more direly useful to computers, but the names make more sense to human beings.

Missing Link

I'm eagerly looking forward to the Qdos TCP/IP support, because it should allow a lot more than web browsing, with Progs HTML (HyperText Markup Language) viewer, a portable web browser based on Lynx (recently ported to Qdos by Jonathan Hudson) or the Unix 'Python' code. It will be possible to read Usenet News, transmit and receive Email, check the time, save and load files over the Internet via FTP (File Transfer Protocol) issue commands on remote machines (Telnet) and access network file systems using machine-independent NFS - so Amiga, Unix, Mac, PCs or other UDP-aware boxes can act as file servers for your QL collection, connected via serial or (bidirectional) parallel ports. I guess we're going to want a Qdos/SMS Ethernet adapter next! Watch this space...

simon@studio.woden.com

```
1000 REMark JOB_NAME "ClockAdjuster_bas"
1010 :
1020 REMark This program helps the RTC to maintain
1030 REMark the time more accurately. Modified for
1040 REMark QL/Thor SuperBASIC compatibility by SNG
1050 :
1060 TimeFile$="FLP1_TimeFile"
1070 :
1080 TK2_EXT
1090 NotFound=-7 : CorrectClock
1100 :
1110 DEFine PROCedure CheckTimeFile
1120 REMark Automatically called once a week
1130 LOCAL TFCh%,Response$(1) :REMark Response,SecondsOut
1140 LOCAL StartTime,AdjSoFar,CorFactor
1150 LOCAL StartTimeHigh,StartTimeLow
1160 LOCAL AdjRequired,TimeElapsed
1170 TFCh%=FOP_IN(TimeFile$)
1180 IF TFCh%=NotFound
1190 REMark File not created yet
1200 PRINT "Confirm the clock time is correct"
1210 PRINT "before the Time File is created"
1220 PRINT DATE$"Is the clock correct? y/n"
```

```

1230 REPEAT WaitCorrect
1240   Response$=INKEY$(-1)
1250   IF Response$=="y"
1260     REMark Clock is correct
1270     TFCh%=FOP_NEW(TimeFile$)
1280     IF TFCh%<0
1290       PRINT "Can't create"!TimeFile$
1300       RETURN :REMark leave procedure
1310     ELSE
1320       StartTime=DATE
1330       StartTimeHigh=INT(StartTime/65536)
1340       StartTimeLow=StartTime-StartTimeHigh*65536
1350       AdjSoFar=0
1360       CorFactor=0
1370       PRINT #TFCh%,StartTimeHigh\StartTimeLow\AdjSoFar\CorFactor\DATE
1380     END IF
1390   CLOSE #TFCh%
1400   PRINT "New"!TimeFile$"created"
1410   RETURN :REMark leave procedure
1420 END IF
1430 IF Response$=="n"
1440   PRINT "Use SDATE or ADATE to correct it"
1450   PRINT "then start again."
1460   RETURN :REMark leave procedure
1470 END IF
1480 END REPEAT WaitCorrect
1490 ELSE
1500   IF TFCh%<0
1510     PRINT "Can't open"!TimeFile$
1520     PRINT "So leaving procedure."
1530     RETURN
1540   ELSE
1550     REMark Update CorrectionFactor
1560     INPUT #TFCh%,StartTimeHigh,StartTimeLow,AdjSoFar,CorFactor
1570     StartTime=StartTimeHigh*65536+StartTimeLow
1580     CLOSE #TFCh%
1590     TFCh%=FOP_OVER(TimeFile$)
1595     PRINT "System time"!DATE$
1600     PRINT "How many seconds adjustment required?"
1610     PRINT "(Use + if slow, - if fast)"
1620     INPUT AdjRequired
1630     ADATE AdjRequired
1640     TimeElapsed=DATE-StartTime
1650     AdjSoFar=AdjSoFar+AdjRequired
1660     CorFactor=AdjSoFar/TimeElapsed
1670     PRINT #TFCh%,StartTimeHigh\StartTimeLow\AdjSoFar\CorFactor\DATE
1680     CLOSE #TFCh%
1690     PRINT "Update done."
1700   END IF
1710 END IF
1720 END DEFINE CheckTimeFile
1730 :
1740 DEFINE PROCEDURE CorrectClock
1750   REMark Call this every boot up
1760   LOCAL TFCh%,LastTime :REMark Response,SecondsOut
1770   LOCAL StartTime,AdjSoFar,CorFactor
1780   LOCAL StartTimeHigh,StartTimeLow
1790   LOCAL AdjRequired,TimeElapsed
1800   TFCh%=FOP_IN(TimeFile$)
1810   IF TFCh%<0

```

```

1815     CheckTimeFile
1820     REMark PRINT "Can't open"!TimeFile$
1830     REMark PRINT "so clock not corrected."
1840     RETurn :REMark Leave procedure
1850     ELSE
1860     INPUT #TFCh%,StartTimeHigh,StartTimeLow,AdjSoFar,CorFactor
1865     IF EOF(#TFCh%) THEN LastTime=DATE: ELSE INPUT #TFCh%,LastTime
1870     StartTime=StartTimeHigh*65536+StartTimeLow
1880     CLOSE #TFCh%
1890     TFCh%=FOP_OVER(TimeFile$)
1900     TimeElapsed=DATE-StartTime
1910     AdjRequired=TimeElapsed*CorFactor-AdjSoFar
1920     ADATE AdjRequired
1930     AdjSoFar=AdjSoFar+AdjRequired
1940     PRINT #TFCh%,StartTimeHigh\StartTimeLow\AdjSoFar\CorFactor,LastTime
1950     CLOSE #TFCh%
1960     PRINT "Clock corrected"
1970     IF DATE-LastTime>60*60*24*7 THEN CheckFileTime
1980     END IF
1990 END DEFine CorrectClock
2000 :
2010 DEFine PROCedure s
2020 SAVE_O flp1_BOOT
2030 END DEFine s

```

Are you sitting comfortably? - Part 3

Geoff Wicks

I once applied for a translation job by Radio Netherlands. One of the last stages of the selection procedure was a practical test at the studios. We were required to translate Dutch domestic press agency reports into a suitable form for an English language news bulletin. The potential audience, we were warned, would know little of Dutch politics or society, and may have a limited knowledge of English. The test was done under time pressure.

At the beginning of this test I panicked. This was not because of any deficiencies in my knowledge of Dutch or Dutch society, but because I was sitting for the first time in front of a MAC. The letters on the screen were too small to read, and the contrast on the screen irritated me. Fortunately my eyes soon adjusted to the situation, and even if I did not get the job, my efforts were good enough to get me on the final shortlist.

This is a good test for any computer display. Would a computer literate person sitting in front of your screen for the first time feel at home?

A Maverick Computer

The QL is a maverick computer with maverick users. There is probably no other computer system with such a wide range of monitors, and probably no other computer that allows its users such a wide choice of what appears on their display. At one end of the scale there are users who are still using their TV, whilst at the other there are those with a state of the art 17in SVGA. Some just load the occasional program, whilst others have 10 or more programs multitasking. This diversity is healthy, but it does make the task of the software writer difficult.

There are many regulations governing computer monitors, most of which are too technical for this article. Instead we are concerned with how easy it is to read a display, and what is expected of well written software. As a trader I soon discovered that what appears a good display on my monitor may not be suitable for another man's system. I had to make changes to accommodate some clients. Even on your own monitor the test should not be whether you can read and follow it, but whether another user would feel like I felt sitting in front of that MAC.

This article is based on advice given by Dutch Trade Unions on the health and welfare of computer users.

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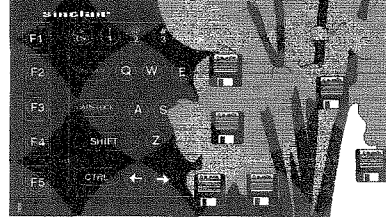
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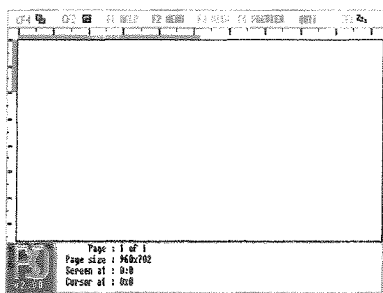
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We can accept payment by VISA, Mastercard and Switch. You can also pay by Eurocheques made out in Sterling or a Sterling cheque drawn on a UK Bank. Prices include Post and Packing in Europe.



Basic Essentials

There are some simple rules governing the letters on a display. The basic matrix forming the letters should not be less than 7 x 9. The width of the letters should be 70% to 80% of the height of a capital. The width of the letter plus space between letters should be 1.2 to 1.3 times the width of the letters, and the distance between lines of text should be 1.5 to 2 times the height of a capital letter. The space character should be one character width.

The ideal distance between screen and user is 50 cm to 70 cm, and the letter size on your screen should be no less than 1/200th and preferably 1/150th of this distance. This means that, to be easily read, the letters on your screen should be at least 3 mm and preferably 3.5 mm high.

The bad news is that CSIZE 0,0 does not correspond to these rules. It is formed on a matrix of 5 x 7. The better news is that the total matrix, that is the matrix that allows for the space between letters and the space between lines of text, is 6 x 9. The even better news is that the larger CSIZES have a matrix of up to 7 x 7 on a total matrix of 8 x 9. The really bad news is that almost all QL software is written using CSIZE 0,0 and cannot be modified.

The reality is that CSIZE 0,0 is barely adequate for CGA monitors, let alone for high resolution screens.

In spite of its physical deficiencies the QL font is reasonably legible, when compared with the list of letters easily confused on computer screens:

X, K and H T, Y and 4
J, I, L, 7, 1 and I (Chr\$(124))
Z and 2
B, 3 and 8
O, Q, & (chr\$(166)) and the number 0
S and 5
M and W
m and w
u and v

The main QL problems appear to be characters m and n and characters a and o. Also the scandinavian characters Æ and Œ and æ and œ.

I would recommend a critical use of high resolution screens. It may be better not to use the higher resolutions for text programs. Reserve the high resolutions for graphics!

Software is better

If what I have written about the QL character set makes depressing reading, at least I have better news about the software. With one exception the shortcomings of the QL screen has ensured that most QL software conforms to the recommendations. The one shortcoming is the lack of a brightness command. It is recommended that when you highlight parts of a text, it is sometimes better to use a different brightness than a different colour.

It is also recommended not to use too many colours in non-graphics programs as these will tend to confuse the user.

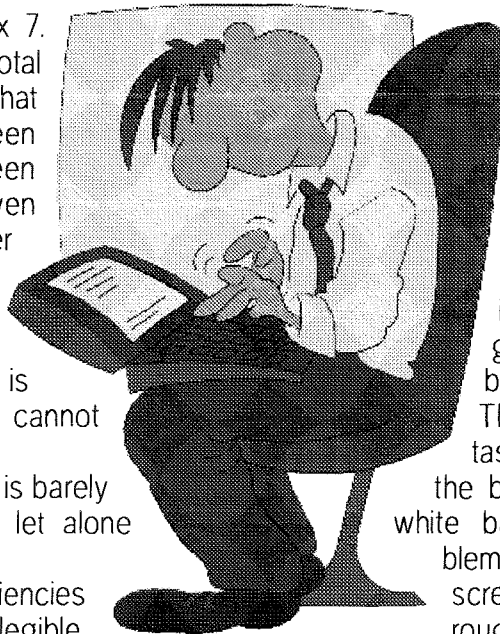
Bright reds and bright blues should be avoided.

Since mode 4, in which most QL software is written, has only four colours, QL users have learnt from the beginning the sensible and constructive use of colour. (The main disadvantage of the mode 4 colours is that they cannot be distinguished in some forms of colour blindness.)

There is a suggestion that for tasks such as word processing the best colours are black ink on a white background. This reduces problems of reflection on the monitor screen, and this combination has roughly the same contrast as printed paper.

However some monitors reproduce some colours badly, and software writers should, where possible, allow for the colours in their programs to be configurable, and make a border optional. A border, which can be irritating on some CGA monitors, is essential on a high resolution screen.

There are other hallmarks of well written software, and, again, on this point the QL has a good tradition. The screen must not be cluttered up with irrelevant information, and commands must be easily entered. We should be grateful to Psion for setting the trend. Compare Quill with some PC wordprocessors of the same generation, or more recently multitasking under



QPAC 2 with multitasking under Windows. There are a lot of things we take for granted in QL software that are not always present in other computer systems.

This article concludes this short series on the health aspects of computers. If there are matters you feel I have missed, please get in touch, and I will see if I can cover them. This last article was rather more negative than I had expected when I started writing. I would like to hear of your experiences of using high resolution screens, and also of any suggestions of coping with the CSIZE 0,0 font problem.

■

Obtaining Quad-Density 5.25" Floppy Drives or Converting TEAC 1.2MB Drives To 720K

John J. Impellizzeri

While working on a couple of different disk drive interfaces for the Timex/Sinclair 2068 (the American version of the Spectrum) for a friend, I needed to replace a quad-density (720K) 5.25 inch floppy drive. These drives used to be easier to find but seem to have all but disappeared now. 1.2 MB drives for PC's seem to be the only ones available other than 360K drives which are usually used and nearly giveaway priced and can't be used anyway.

I set out to try to find a way to get these drives to function as 720K units. Since the QL used to and can still use this drive format, I felt this might be valuable time and effort spent. My starting point was an article in IQLR a few years ago by Don Waltherman who was successful at this using certain models of Panasonic drives. I was not able to locate any of these drives, however, the theory and techniques behind this still seemed valid.

I did find that TEAC drives are easy to find over here, most PC supply stores carry them and many PC trade show vendors have them also. Then I remembered that TEAC used to have good technical support from the days of getting various models of TEAC ED drives to work with the Gold Card. Trying their fax-back

service first since it was late at night and I didn't really feel like having to explain what a 2068 or QL was, I requested info on their 5.25" 1.2MB drives. After some studying of the documentation and referring back to Don's article, I felt that it would be possible to get the drive to work at 720K.

I bought a TEAC model FD55-GFR-7219 5.25" 1.2MB drive for \$22 at a local PC trade show. After some experimenting and testing, I found that the drive will function as a 720K unit. The 2068 and QL could read disks made on a true quad-density drive and could also write disks that a true quad drive could read. In this mode they could also read a 360K disk.

In order to make this drive work at 720K, two additional jumper straps are required in addition to the factory settings. A strap needs to be placed over the LG pins and the I pins. The jumper locations are silk-screened on the pc board and are located just above the drive select pins near the right side of the board. The drive select pins are arranged in a cross pattern and can be set accordingly (drive 0 through drive 3 are supported).

While the drive I used was marked as model number FD55 GFR-7219, according to the documentation any drive in the 7000 series should work as above. The 7219 was hand written on the label of my drive. There may be other TEAC models that will work although I have not verified this. It appears from the TEAC documentation that a model FD-55GFR-1xx or a model FD-55GFR-5xx may also work. These are 1.2M byte drives and have the same jumpers and jumper definitions as the 7000 series drives.

I mostly use 3.5" floppy disks but I still have a number of older programs and data files stored on 5.25" disks which I occasionally need access to. I'm no longer too concerned with having to do a mass-conversion to 3.5" disks before my 720K 5.25" drive gives up the ghost.

I do hope this article has been of interest and possibly of some use to QL users. I would be interested in hearing from anyone who uses this information (successful or otherwise), especially if someone is able to use another model of drive. I can be reached via any of the QL Fido-net connected BBS's or via email at

jimpellizzeri@compuserve.com

■

Letter-Box

Pedro Reina sent us an email from Spain:

I'm still active in the QL World, although most of the time I'm using PC's.

I'm a subscriber to the excellent "QL Today", and I think that your work as editor is excellent, as the magazine is always very exciting.

In Volume 2 Issue 4 you ask for opinions about including Z88 material in "QL Today". I dislike this idea, as I prefer to just read about the QL and its compatibles. Just my opinion!

Lafe McCorkl wrote:

Can the Iomega Zip Drive be used with QPC operating on a native Windows95 PC?

Of course you can! I've been doing it for some time now, but the whole procedure can be quite unhandy.

In order to use the Zip drive with QPC you must run Iomega's

GUEST.EXE

file from your QPC autoexec.bat file. (Actually you don't have to. After you boot QPC you could shell out **SHIFT+CTRL+ALT+SCROLL** to Dos, then type

GUEST

then type

EXIT

But that is unhandy.) To do that you must find the right autoexec.bat file to modify. If you use Explorer and right click on QPC.EXE it probably will not work. If you have an icon for QPC on your desktop, or anywhere else, that you use to start QPC, you must right click on that icon and select 'Properties' to modify the autoexec.bat file that is actually used to load Windows-Dos for QPC.

Once you get Guest installed you can access your Zip drive from QPC. Now is when the fun begins. QPC cannot format, that is place a QXL.WIN file on, the Zip drive. In order to use Zip you must copy an existing QXL.WIN to the Zip drive. Want to create a 100MB QXL.WIN on a Zip disc? Then you need a 100MB QXL.WIN on a hard drive to copy to the Zip drive. The actual maximum size on the Zip drive is in the neighborhood of 97MB, but you will have to discover that for yourself. Trial and error!

I don't know if it would be possible to completely run QPC from a Zip drive, but... I'll leave that for someone else.

I actually typed the above using QPC and

Quill. I then saved a lis file to Win3_ (On my E:\ hard disc of course. My Zip drive is G:\ to dos.) I could not print from Quill, but Qpac2 printed the lis file nicely as well as displaying a full page on a 1024x768 screen.

[According to Marcel Kilgus, Author of QPC, it is possible to format QXL.WIN partitions on ZIP drives much faster than before; it was not impossible, it just took ages (about 42 seconds/MB), now it does 95MB in 12 seconds!]

Arnould Nazarian wrote:

Yesterday, I bought a USR Sportster 33.600 Voice modem and I was now the first time in your BBS. Making the cable was the main problem! For users of the good old black box, please repeat as often as you can that you should connect pins 6 and 20 together in the DB25 connector. This will make sure that your modem does not drop the line when you are in the BBS.

John Wakefield, Worthing, England writes:

It seems that printers have been the most troublesome bits of kit to set up over the years, judging by the letters that have been published in the various mags; QL User, QL World, Quanta and IQLR, not to mention QL Today (which I am not, because I cannot remember seeing letters to that effect yet).

So here is one!

I suffered hours of grief when I first bought an HP Deskjet, about 5 years ago, but after having obtained the printer codes after a few weeks, I managed to set it up with Perfection as the word processor. I even managed to get it to print in colour, using the highlight feature.

Perfection, however, was a real pain when it came to alignment of tabs, because I used them regularly when writing quotations to clients. For that reason I switched to Text87, and found that tabs and the layout feature gave excellent results. No colour though.

The programs that I have written, which do invoicing, statements, planned service visits, and so on, are happy when printing in colour, because I have included the relevant codes in the print statements. This, however, is all in SuperBASIC.

I have also bought two Canon printers, which are easy to make print in colour, but again only from SuperBASIC (and SBASIC, I should add).

Roy Wood tells me that the cover of the

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and
Shareware
Software

QUBBESoft P/D

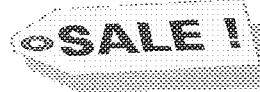
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manual for the new program Q-Route (which I have bought) was produced using Linedesign with a bitmap image, and that it printed in colour.

My new Canon BJC 4200 will not print such pages from Linedesign in colour, and so I guess there is no suitable driver for it in the Proforma / Prowess package.

I would write printer drivers myself if I knew how to. I have no idea what is needed, nor how to program in assembler, although I have read many books on the subject of machine code programming, and failed to understand any of them. I do not think I am particularly thick, but I probably need the principles explained to me as if I were an idiot. (One of Dilwyn's apt comments should appear here.) **[As if I would! - Editor]**

No-one in our user group seems to have much idea about assembly language, and so I do not know how to progress. Even if I could perform this mysterious task, I still would not know what was necessary to write a driver.

Is there a tutorial which is aimed at my level of knowledge (ground level)? Is there someone out there who knows about printer drivers and is willing to tell me how to write one? Can the writers of Text87, Linedesign, etc. write drivers so that us users can make use of colour printing, thus saving me the bother? (Lazy wotsit, I hear you cry.)

[I don't think a manual or tutorial exists, and the only help given by the author of Text87 are some text87-printer driver assembler sources, very well documented - Jochen]

It is most annoying when I see PC users producing wonderful colour documents. They merely have to install the set of drivers and fonts which are supplied with printers, and they are away. I have a box full of such disks now, which are useless for the QL. I wish they could be converted to QL format.

It seems to me that anyone getting to grips with this problem would make a lot of QL users very grateful, and able to show the PC bunch that we can do anything that they can, with knobs on!

[As Roy stated, most of these printer drivers require more RAM than all the QL-users own, just to install them - let alone using them. To me, PROGS seem to have done a nice job with ProWesS which allows you to print colourful pages but takes care about "our" concept, i.e. NOT wasting resources as much as possible.]

■

The use and abuse of floppy disks and drives

- Part 1

Mark Knight

1. History and basics

Floppy disk drives are a minor miracle of modern engineering that most computer users take for granted. In this text I intend to give some information that may be both interesting and useful, explain how to get the best out of a floppy disk system and why some restrictions exist. A little history will help.

Originally flexible disk drives, to give them their correct name, were 8 inch drives that looked like enlarged versions of 5.25 inch drives. The most advanced of these were 40 track single-sided drives and they held what was then a massive 90k of data, costing about \$500.00 per drive and \$5.00 or more per disk. Later double-sided drives increased the capacity to 180k while at the same time 80 track single-sided drives came along with the same 180k capacity. Double-sided double-density soon arrived and provided 360k of storage on a single 8 inch disk.

These two competed for a few months but the 5.25 inch drive was around by then and this was already cheaper although initially it held only 180k on a disk. (Incidentally the original 8 inch drives are the reason why 5.25 inch and 3.5 inch drives are known as "diskette" drives). Later the capacity was doubled to 360k to match the 8 inch drives and sales of the big drives quickly ceased.

Later double-sided double-density 5.25 inch drives were developed holding 720k of data. History repeated itself and these never caught on in the IBM compatible world because by then (around 1983) single-sided 360k and double-sided 720k 3.5 inch drives had arrived. Although more expensive the 3.5 disks were popular and prices soon dropped until the extra cost of the smaller drives was of little consequence. A major factor was the better protection of the 3.5 inch disks which made them more reliable in most environments even though they packed the same amount of data onto a smaller area of magnetic coating.

Both 5.25 inch and 3.5 inch disks at this stage used 80 tracks per disk, were double-sided and were formatted to 9 sectors per track, giving

720k formatted capacity. The modern High Density (HD) 3.5 inch drives use 18 sectors per track and so pack 1,440k onto the same area, while HD 5.25 inch drives hold slightly less data, around 1,200k because they use 8 sectors per track instead of 9.

2. How they work

The coating on a floppy disk is a special magnetic material that is fairly stable both chemically and magnetically. It is made up of microscopic particles that can have their magnetic alignment changed by imposing an external magnetic field over them; these are embedded in a matrix material of highly polished hard synthetic resin laid onto a polyester disk. To write to the disk the drive head imposes a tiny short wavelength field over the disk using an electro-magnet, changing the alignment of the fields to represent lots of little one and zero bits. One field alignment means zero and the other means one.

When reading the head's electro-magnet has no current passed through it, so the magnetic field of the head is almost absent. The different alignments of fields passing by the head in the disk surface overwhelm its own field and induce micro-electric currents in the head which are amplified, partially decoded and transmitted to the host computer as a stream of zero and one bits.

In a DD drive the wavelength and energy of both reading and writing can't be changed, but in order to be able to use DD disks an HD drive has to be able to vary both the wavelength and energy of the field used to write to disks, as well as be able to read two different wavelengths. When reading an HD disk the rotation rate is exactly the same as a DD disk but there are usually 18 sectors per track instead of 9. This means twice as much data can be read or written in the same length of time so HD disks are faster as well as holding more data.

There are also different requirements for the magnetic properties of the recording material on the disk, because of the physics involved. All magnetic recording media have a limited frequency range that they will reliably hold, not too limited at long wavelengths but very strictly limited at the short wavelength (high frequency) end. This limit stems from the very properties that make the material suitable for magnetic recording in the first place.

The materials used are a mass of microscopic particles, each one a weak magnet. The field of each particle won't dissipate but can have its

alignment changed. This property of stable but externally changeable alignment is what makes it possible to record on the material. The measure of how easily the magnetic field of such a material is realigned is called its "coercivity", derived from the fact that an external magnetic field "coerces" the field of the particle into alignment with its own.

When recording we simply impose a local magnetic field over the material using the recording head, which changes the alignment of the tiny particulate magnetic fields to match the alignment of the head at the time. Switching the alignment of the field in the recording head is easy, the drive changes the direction of current flow through the coils of the magnet. Imposing these short wavelength fields on the material as the head passes over it will record a pattern of magnetic fields on the coating so it can now be said to hold some data.

As locally most of the particles have the same alignment a kind of wave pattern is produced in the material, with magnetic fields locally together, which tends to keep them lined up. If however we try to record a short wavelength we will have fields very close together with different alignments: in this case they tend to force each other into alignment and the short wavelength data will fade. This effect stretches over quite large numbers of particles not just one or two, so the size of magnetic particle used has to be very very small to record the wavelengths used in floppy drives. Each "particle of magnetism" that can be individually realigned is known as a "domain" or more precisely a "magnetic domain".

In addition the polish on the disk material and drive heads is important so that the two can meet as closely as possible. This allows the magnetic field of the read/write head to penetrate into the surface of the disk and realign magnetic domains to a good depth. It also allows the head to be affected by a good depth of particles when reading the disk.

Taken together all this means that every recording material has a lower wavelength limit: trying to record shorter wavelengths is a waste of time as the data will fade if the wavelength comes too close to the size of a single domain. This is because the relatively high coercivity of the particles even allows them to affect each other over such short distances. Using finer particles with lower coercivity helps as the particles then don't push each other out of alignment over such long distances.

This has another penalty: a higher energy field is required to write on them in the first place

because of the lower coercivity that in turn permits the shorter wavelength. Raising the energy too much restricts the frequency in another way because domains further from the head can become affected. There is a delicate balancing act involved in the design of the humble floppy disk drive.

To use a reasonable amount of the disk material the drive heads can be moved further from or closer to the centre of the disk. There are a number of preset positions for the head, each forming a single recording track on the disk that is separated from the others. The tracks have to be separated by a small distance otherwise recording on one track might overwrite or damage data on another track.

In addition some allowance must be made for slight inaccuracies in the position of the head, since engineering a perfect positioning mechanism is impossible. The distance between tracks is set by the standard drive hardware, and on modern floppy drives there are normally 80 tracks on each side of the disk. The tracks are numbered from 0 so track numbers range from 0 to 79 rather than 1 to 80.

When 3.5 inch DD drives were developed the best materials available to make disks at reasonable cost were used. This set the sensible limit at 1Mb of unformatted data on a disk or 700-800k formatted depending upon which operating system was used. The drive had enough power to write to this material and were sensitive enough to read it without costing outrageous amounts of money.

An HD disk requires more energy to write to it, since it uses magnetic particles with lower coercivity to allow the shorter wavelength. This is exactly half the wavelength used on a DD disk so that we may have 18 sectors in each track rather than 9. In addition shortening the wavelength requires a smaller head gap, that is the gap between the poles of the magnet in the read/write head, which makes the heads in an HD drive slightly more expensive for a given production volume. As a shorter wavelength also means a higher frequency the electronics of the drive have to be twice as fast which makes them slightly more expensive too.

Reading from a disk is also more complex than you might think. To recap, reading the disk the head is passed over it with no electricity pumped through the coils in the electro-magnet. Passing the coils through the magnetic fields on the disk induces currents in them which vary in strength and direction as the fields recorded on the disk pass through. This current is amplified and interpreted as the data originally written to the disk.

But changing from DD to HD the wavelength shortens and this requires a different type of read/write head. Shorter wavelengths on magnetic media means higher frequency waves which also means weaker ones for a given magnetic field strength. So it not only takes more current to write to an HD disk it also takes more sensitive heads to read from it. The electronics in the drive allow it to switch to a lower current when writing DD disks and sometimes to lower the amplification when reading from them.

ED drives need to be able to read even lower levels of magnetisation as the wavelengths are halved again, and of course they also have to be able to use still higher current levels in the heads to write to the still lower coercivity material on ED disks. As well as this they must be able to match their write current to the coercivity of HD and DD magnetic media and use different levels of amplification reading them. The head gap becomes even smaller and so ED drives cost more to make, particularly as they didn't catch on in the way that drive makers had hoped.

All this hopefully explains why disks formatted to the wrong density are unreliable. If you buy DD disks and punch holes in them to fool the drive into using them as HD disks you are asking for your data to be recorded at a shorter wavelength than the material on the disk is designed for. This makes the data likely to fade as the wavelength more closely approaches the domain size of the material and the higher coercivity allows it to fade.

Interestingly, trying to format an HD disk as a DD one by taping over the identification hole is likely to produce an even less reliable disk. This is because a DD format is matched to the current levels required to write to the coating of a DD disk: the energy levels used won't reliably realign the domains in the lower coercivity material of an HD disk. If you are using a DD drive it simply won't have a high enough energy level. An HD drive will be designed to sense the longer wavelength of the write data and lower the energy level to that required for DD disks. Of course ED disks require an even higher energy level so formatting them to HD or DD will produce very unreliable disks indeed.

Take no notice of anyone who tells you that the material on a DD disk is the same as that on an HD disk or an ED disk. They have different levels of coercivity this is not just marketing trickery, so using disks at a density different from their rating is likely to lead to lost files. It might work for a while, but it will probably work just long enough for you to think your precious college essays are OK on one DD disk format-

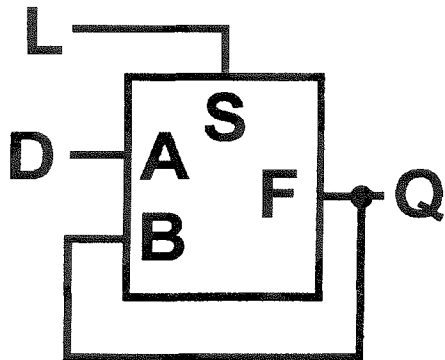
ted to HD after punching a hole in it. No doubt it will be the one file on the disk that isn't backed up yet that disappears...

The next part of this article explains how to maintain your disk drives and disks.

Logical Fundamentals - Part 3

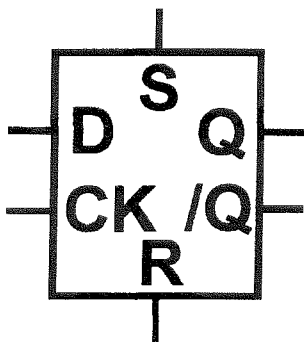
Stuart Honeyball

This time we'll look more deeply into the make-up and application of flip-flops. The concept of the flip-flop was touched upon in Part 1. To recap, a flip-flop is a device that stores a logical state (either high or low). For example, a simple "D-type latch" can be constructed from a multiplexer:



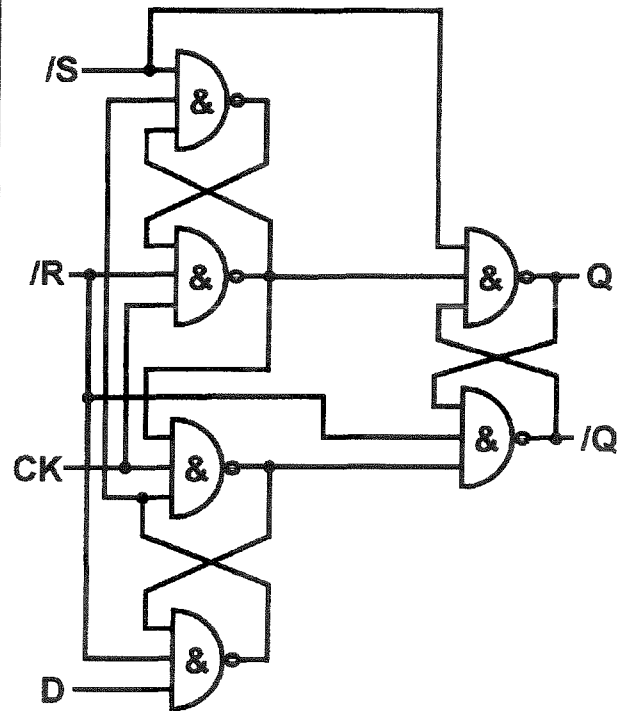
When the L (latch control) input is high then the latch's output Q reflects the logic level applied to the data input D but when the L input is low then Q holds the value that D was just prior to L going low. The D input can now change although the Q will not.

There is another class of flip-flop which remembers the value which is applied to the D input at the instant the clock input transitions from low to high and has the following symbol:

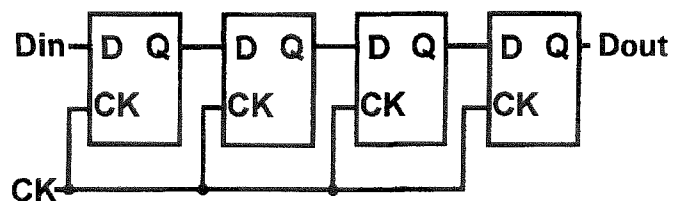


These edge-triggered flip-flops often come with set (S) and reset (R) inputs as per the R-S

latch and it is usual for these inputs to override the D and CK inputs if there is a conflict. The D input is



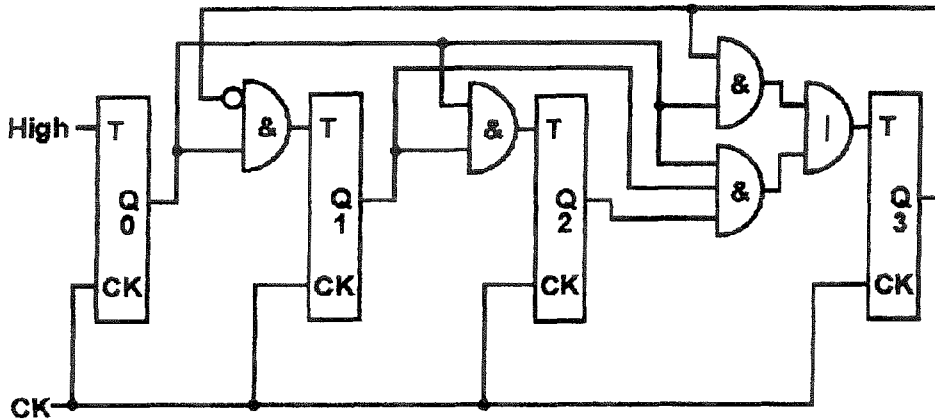
referred to as synchronous because its value is used relative to the CK clock input whereas the S and R inputs are asynchronous. A logic circuit commonly used to construct this type of edge triggered flip-flop is shown here although it is complicated to work through what actually happens when various stimuli are applied. It is not necessary to know the inner workings of flip-flops and their implementation can vary widely according to what technology is used. Edge triggered flip-flops can be combined to make useful logic functions. The simplest is probably the shift register. The diagram shows a 4 bit shift register:



What happens is that the data input on Din is clocked into the first (leftmost) flip-flop at the instant of the rising edge of the clock CK. On the next rising edge of CK the value held in the first flip-flop is clocked into the second and the current Din value is clocked into the first flip-flop. You can probably now see that whatever is applied to Din at the time of a clock edge appears at Dout 4 clock cycles later. It could

therefore be used as a delay circuit. Another use of this type of shift register can be found in the Miracle Systems QL Centronics Interface. This uses an 8 bit shift register to convert the serial bit stream from the QL's RS232 port to a parallel byte required by the printer. As a byte is sent from the QL one bit at a time 8 clock pulses are applied to the shift register. Each of the flip-flops' Qs are connected to the appropriate data line on the printer's parallel port so that the whole byte can be presented to the printer in parallel.

Another common use for edge triggered flip-flops is in counters. A counter uses several flip-flops arranged in a line so that their combined outputs constitute a binary number. Each time a clock edge is applied this binary value is incremented by 1 unless the maximum count value for the counter has been reached in which case the counter value is set to zero and counting up starts again. The flip-flops used here are of the T-type. When the T (synchronous) input is high the Q will change state after the clock edge but when the T is low the Q does not change. Remember that the T input value is only relevant during the rising edge of the clock - its value is ignored when the clock is low, high or transitioning from high to low. The circuit shown is a decade counter (counts up to ten and then clears to zero):



Count Sequence

Q3	Q2	Q1	Q0	=	
0	0	0	0	=	0
0	0	0	1	=	1
0	0	1	0	=	2
0	0	1	1	=	3
0	1	0	0	=	4
0	1	0	1	=	5
0	1	1	0	=	6
0	1	1	1	=	7
1	0	0	0	=	8
1	0	0	1	=	9
0	0	0	0	=	0

This type of counter used to be quite common since decimal output is widely used in displays. Nowadays, though, microprocessors usually do all the hard work of presenting decimal output formats. This format is also known as binary coded decimal (BCD). Related to this are the 68000 instructions ABCD (Add BCD) and SBCD (Subtract BCD). Also note that the number of times the Q3 output cycles Low-High-Low is a tenth of the number of clock pulses applied and so it can be viewed as a "divide by ten" frequency divider.

In practice it would be impossible to make a flip flop that only viewed its synchronous input at the instant of a clock edge. Real world edge triggered flip-flops need to have their asynchronous inputs stable around the time of the clock transition. Data sheets of flip-flops give set-up and hold times; the input needs to have its value stably set-up before the clock edge and must be held stable for a time after the edge. Quite often the hold time is zero which makes circuit design simpler. To see this look at the shift register shown earlier. Each D input must have the previous Q's value held for the hold time. A lot of data sheets do not actually quote a minimum time from the clock edge to the Q changing and so it must be assumed that this is the minimum theoretically possible - cause and effect deems this to be 0. This means that the hold time for the D

input that the Q is connected to must be 0 otherwise the Q could have changed inside the hold time which would not guarantee that the circuit would work properly. The set-up time in this case will obviously be greater than zero so that there is a finite stable period when the asynchronous input is required to be stable. ■

Help! Help!

Does anybody know how to patch ProFortran and/or ProPascal in such a way, that the ROM-Image can be saved to floppy/harddisk and loaded into SMSQ/E on the QXL or QPC?

As far as we know, it checks whether the EPROM-code is actually in EPROM (or ROM) and refuses to start if it thinks it is NOT in ROM.

Any help on how to get it working on other systems would be more than welcome - please write to QL Today if you know a solution.

Gee, Graphics! (on the QL)? - Part 2

H.L. Schaaf

Some readers may have downloaded the files mentioned in the previous article. Here's an explanation of how they're supposed to work:

EnMotion Escher in Motion

"In motion" is also called "animation". A scene is changed slightly and the human eye-brain interprets the change as a smooth continuous movement rather than as the actual abrupt discontinuous displacement. I've been surprised and pleased to see how large a change the eye-brain system can accommodate.

Once a mathematical model of the object has been developed to the point where satisfactory screen images can be made, then it is relatively easy to loop through variable(s) to produce a series of slightly different sequential screen images. Each screen image is saved with a unique sequential name. It may take several minutes or even hours to make each image. Hopefully the last frame will make a smooth closure to the first frame so that repeated cycles appear smooth and seamless.

How many screens (or 'frames' as they are called in movies) can be held in memory? To SBYTES a full screen takes 65 sectors. I like to include the generating program, a boot program, and a display program on the disk along with the saved screens. I've been able to get 21 frames on a DD, 35 on a HD, and 70 on a ED disk. I've found RAM as the best way to store and quickly and smoothly show a sequence of frames. A Trump Card matches the DD, a Gold Card matches the HD, and a SGC matches the ED disk capacities.

```
460 :
470 CLS#0
480 PRINT #0\\"Program finished"
490 STOP
500 :
510 DEFine PROCedure prompt(step_num)
520 CLS#0
530 PRINT#0;"Please Touch [Space Bar] to continue"
540 PAUSE
550 CLS#0
560 LIST #0,line_nums(step_num,1) TO line_nums(step_num,2)
570 PRINT#0;"Please Touch [Space Bar] to do line";
580 IF line_nums(step_num,1)<>line_nums(step_num,2) THEN
```

To move the frames from disk to RAM I find it faster to do a 2 step transfer, first LBYTES a frame from disk to screen then SBYTES from screen to RAM and repeat until all frames have been transferred. This is quicker than copying all the frame files from disk to RAM since the files are 'swallowed' in big chunks instead of little bytes. This method also provides a 'preview of coming attractions'.

The boot program does the transfer of frame files from disk to screen to RAM and then calls a display program which sequentially transfers frames from RAM to screen fast enough to 'fool the eye-brain' so it appears as an object in continuous motion. The display program allows the viewer to change the 'speed' with the up and down keys, change the direction of movement with the left and right arrow keys, and stop and go by toggling with the space bar. The escape key is used to exit the display program.

For an ordinary QL the screen address is at 131072 (which is the same as 2^{17}) and 32768 (same as 2^{15}) bytes fill the screen. For SMSQ/E there is a variable SCR_BASE for the screen address which may be something other than 131072, so edit lines that refer to 2^{17} , changing to SCR_BASE to suit your system.

Another thought is to zip and unzip files. I've also tried using the harddrive instead of RAM; sometimes it works, other times it results in a 'jerky' display. Perhaps this would be a good use for the Minerva 2nd screen. If you used a 200 Meg harddrive and ran at 10 frames per second you could have about a 10 minute movie.

A couple of readers noticed the listing for QL_logo_bas had been truncated at line 450. Lines 460 to 760 contained the PROCedures 'prompt' and 'set_prompts' that were intended to provide an "on-line" tutorial flavor to the program. I suppose the editor glanced at line 480 and acted accordingly! Hopefully, the rest of the program will be listed in this issue.

```

590 PRINT#0;"s ";line_nums(step_num,1);" to ";line_nums(step_num,2)
600 ELSE
610 PRINT#0;" ";line_nums(step_num,1)
620 END IF
630 PAUSE
640 END DEFine prompt
650 :
660 DEFine PROCedure set_prompts
670 DIM line_nums(10,2)
680 RESTORE 100
690 FOR i = 1 TO 10
700 FOR j = 1 TO 2
710 READ line_nums(i,j)
720 END FOR j
730 END FOR i
740 END DEFine set_prompts
750 :
760 REMark end of program

```

Scale, translate, and rotate are common operations in computer graphics. Eventually I hope to touch on all of these, but first some confusion about SCALE.

We have in the QL a PROCedure SCALE that sets the vertical graphic 'scale' in a window and also allows 'translation' of the x and y origins. SCALE also takes into account the MODE the QL is in. Thus we have an easy way to effect a change in image size by using SCALE to zoom in or out, and shift the image horizontally and/or vertically (we can also use PAN and SCROLL within limits) without altering the data points. CIRCLE and ELLIPSE allow rotation. Generally in computer graphics programming the data points are mathematically manipulated to change scale(size), translation(position), and rotation (angle).

I would like to understand how the QL handles SCALE; that is, how can I predict the graphic horizontal scale for a given window, border, and vertical scale? Do any of you readers know how the QL deduces the x graphics scale (it seems to depend on the ROM ver\$)? Some of my thoughts on this in the next issue.

Editors' note: Sorry about the truncated listing. It was not deliberate, just a mistake handling the DTP program. It was not intended to force you, the reader, to read part 2 - Herbs articles are so interesting that there is no need to force people to read them!

The next issue will contain another interesting (and complete) listing!

Also, readers who cannot download the programs do not need to worry: they'll be included in the cover disk which will come with the next issue.

■

Hardware-adventure, using a QL/QXL

Subtitle: Errors that MAY happen -
WILL happen!

Friedemann Oertel

This is the result of some experience in the world of three QLs, Qubide Aurora and two QXLs. Sorry, but for myself, I have to make some comments on Davide Santachiara's article in QL Today #4. Due to his recommendation I have nearly the same hardware as he uses - and I like it too. But perhaps you can prevent an error by this article and have more fun and less stress than I had.

1. QXL - cooling-problems

My QXL1-card with 8 MB worked from its installation perfectly, it was only after some weeks that strange and very severe crashes occurred, that destroyed the whole map of the harddisk and even the cmos-setup. The clock was changed and the pc thought it wrote to 15 MB instead of 540 MB, switching back to DOS and reporting QXL at adress ... not responding. Finished! This happened without any recognizable reasons and when I used the QXL1 - the slower one.

Also, making many backups via network to my Qubide-QLs, I had a lot of hang-ups with no explainable reason. Result: File with length zero without content, some strange docs (e.g. one Quill-page increased to an incredible length of an Xchange document!).

Looking for extremely long or short (length 0) files didn't cure that problem.

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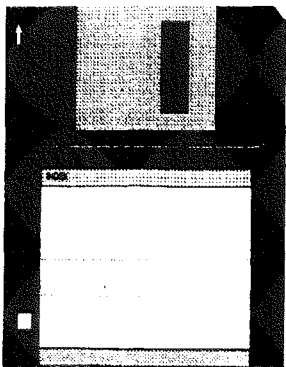
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In combination with another QXL2-PC-tower that I use at school with a higher clockrate, no errors occurred, even as I changed the QXL-cards. So I first looked to find the error in my laptop - in vain.

After more than a year and many, many backups and reinstallations my daughter worked with Turbo-Xchange and she laid a sheet of paper onto the cooling-slots of the laptop's docking station. Much joy! The result was that Xchange would no longer load - neither from harddisk nor from network. At first I believed it was a problem of the harddisk and tried several devices from which to load the program: Without success. But when I removed the QXL and docking station from the laptop and used QPC all was fine!

So I put a heatsink with a cooler on the Motorola-CPU and all the problems disappeared. Even if I copied all night long whole harddisks from QXL to my Qubide-QL via network no further errors occurred. Problem solved. Fine? One disadvantage remained: The cooler takes the place of my second and only remaining ISA-slot.

2. QUBIDE - problems:

2.1 Different ramdisks: QUBIDE-ROM: QRAM

As it seems, the Ramdisc-drivers of QRAM's RAMPRT are level 1 and so there is a conflict with a second QUBIDE-RAMDISK in the QUBIDE-ROM (yes, I really do work sometimes with the old, nice QRAM! Sometimes things go faster). But: IF I want to start a program using Menu_Rext just as DISKMATE 5 or CueShell do you see two active RAMs showed in the defaults-choice-display (WIN RAM RAM N FLP ...).

Also, I get QLib's error-reports, if I want to copy from e.g. WIN1_ to RAM1_. If I answer C(ontinue), file after file is though copied. At the QL-Meeting in Munich 1995 I talked to Albin Hessler about that. Solution: Do a "RAM_use zzz" or do not load the file RAMPRT. This should solve the problem.

2.2 Strange Conner - EIDE-harddisks and bus-terminators:

I connected three harddisks (and more) in changeable cases to my QL, using two of Nasta's drive-expander-cables, made for a maximum of four master-slave-pairs of drives: First a WDC 420 (absolutely unproblematic), a Conner 420 and a Conner 425. Later I bought two fine Syquest EZ 135 with changeable media (described as 135MB, keeping only 128 MB, should be a kind of tax - or what??) for my three QUBIDE-QLs. Sometimes you can get used ones very cheaply.

But there appeared to be strange losses of data in my system - the map was destroyed several

times and undeletable files or directories appeared. Due to this and together with the cooling-problems of my QXL-processor I spent many nights with my system, making backups and saving data (there are better things to do with my time, aren't there ...).

Now those annoying times seem to be over on my systems.

But back to the drives: There should be (even in the same hd-cases!) different kinds of hardware, NOT obeying to the (E-)IDE-controller rules! Some do have integrated resistors as bus-terminators, others haven't! So it could be necessary to insert such resistors (33R to 220R) into the cable to avoid bus-reflections, that kill the map.

Strange: This problem could sometimes be cured by only using cables of different length and/or by putting all ground cables in the computer to one single point. Maybe, in a few cases, you would need coils in the groundlines from the PC-power-supply. Also, simply putting the (Super-)Goldcard into the slot of the QUBIDE-interface may cure the problem in most cases, if it occurs at all. So do not put both cards in different slots. In this way you too have the advantage of one more free slot for other cards!

Strange drives, that could (!) cause problems of different kinds, seem to be some special Conners, that do have the following combination and configuration of jumpers at the back side:

Master drive AND single drive jumpers set both in one of these ways to the first pins:

I : or I : :

(this should be CONNER 420 and 425) may not work together with other harddisk as a slave, even not with another Conner! Used only as single or slave drive (e.g. together with my WDC 420) they do their job together with Qubide very well!

Warning: MAYBE (!!) too in combination with Syquest EZ135 these Conners MAY kill the Syquest EZ-drives!! I heard of two such examples. Guess: I had the luck to be concerned! This appeared, when I tried to change the combination of Syquest 135 and Conner 425 as master and slave vice versa, as it didn't function regularly. I can not say this for general, but, if you can avoid expensive experiences, why shouldn't you?

So, for my case I can recommend the following combinations of my drives as a master-slave-pair (attention to the order: M-S!): WD - Conner, WD - Syquest, Syquest - Syquest

In general: You should connect the slower, older drive as a master, the newer, quicker starting drive with (I hope with bus-terminators) as the slave.

Note: Do not worry, when the indicator-LED for the harddrives is only lightened at the moment of initialisation. This is o.k., if you are using a Syquest-drive. The last has its own LED, which turns from green to orange for a short moment, when you read/write (sometimes hard to recognise, depends on the angle, you look at it).

Another strange effect: If you want to transform data from a harddisk with (partially) corrupted map - your problem - from the older ROM version 1.4x to the newer format with ROM V1.5x be sure you made backups from a drive with unique data before! One time the transformer-program killed all my data on the disk! Grrrr!

What I saw, using my two syquest-drives: After formatting the media the first time QUBIDE reported a corrupted map. Don't worry: Save just any data on disk, delete it, switch off the machine and the world is fine again when you restart it!

In the combination with older ROM (1.41), a Syquest- and a WD-drive, one time I had better experience formatting only that drive in master-position (win1_), but with the new ROM v1.54 and the program partition_exe formatting and partitioning worked fine in the slave-position too.

Partitioning the harddisk: A good improvement for the partition_exe program would be a check,

whether the data, you typed in, is correct and not overlapping other partitions. Guess what happens if you have a partition from track 248 to track 8! One time I saw strange effects (rom v1.41), typing in very quickly the "8", thought for a block-number (wrong) instead of a track-number on my WD 420. I corrected that immediately, partitioned and formatted the drive again. All seemed well after that, but linking in the four partitions by my boot-program, it did not accept the WIN_DRIVE 4,1,4 - command. Typing it in via keyboard, all worked well. A pause in the boot-program and a second command WIN_DRIVE 4,1,4 cured the problem. Guess what happens, if you start the boot-program and hit a key during the inserted pause?

If you try to have a look for the second partition of your hd within QPAC2 and you didn't activate that partition before by WIN_DRIVE 2,1,2 and you then multitask immediately to SBASIC to type in e.g. WIN_DRIVE 2,1,2, you will have to wait, until the cursor appears again. So you have to link in correctly the second partition.

Please do not switch to an already started QPAC2-Files-menu, else you could do stupid things. The map HAS TO be read completely!

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So a big recommendation:

First contact Ron Dunnett or your QUBIDE-dealer, BEFORE buying any harddrives to avoid expensive experiences! The list of accepted drives in some mailboxes may be not the actual one and there may be internally different drives of the same type, especially if you want to combine a master-slave-pair.

Do use only the newest QUBIDE-ROM (now 1.54) and the actual software, you can get it from Phil Borman's box, and your QUBIDE-system should finally work fine.

3. AURORA:

Some hints on AURORA: I bought one of the first pcbs, mounted it into a pc-desktop-case. As I wanted to test it soon, I only mounted one net-connector without a termination-resistor. Result: You have to use both net connectors with both resistors, else the network will not do what it should. The LED will glow all the time, but you will have no connection. This will also happen, if the 8302 is weak.

Also, I had curious Problems (no start of the system or freezing, sometimes no keyboard-function) with an old T90-interface, that worked before with a QL, Goldcard and Qubide-Interface. Two other T90-interfaces do their job now in combination with the Aurora-card, Minerva and Hermes. A disadvantage is the huge space, T90 takes. If you use QPlane, T90 will block one slot. The size and weight of T90 can result in bending its pcb down a little bit on the left side, that is why you may have bad contact at the socket. I always fix my T90s with a little glue.

A nice goodie is Aurora's network-LED: You can see very quickly, whether the QL/Aurora-network is still busy or has ended its job.

Conclusion: This appears to be a long, strange list of errors, but remember, as I wrote in the beginning:

Things that CAN happen - DO happen, at least sometimes!

I wish all users, that they don't and I could help someone with this article.

■

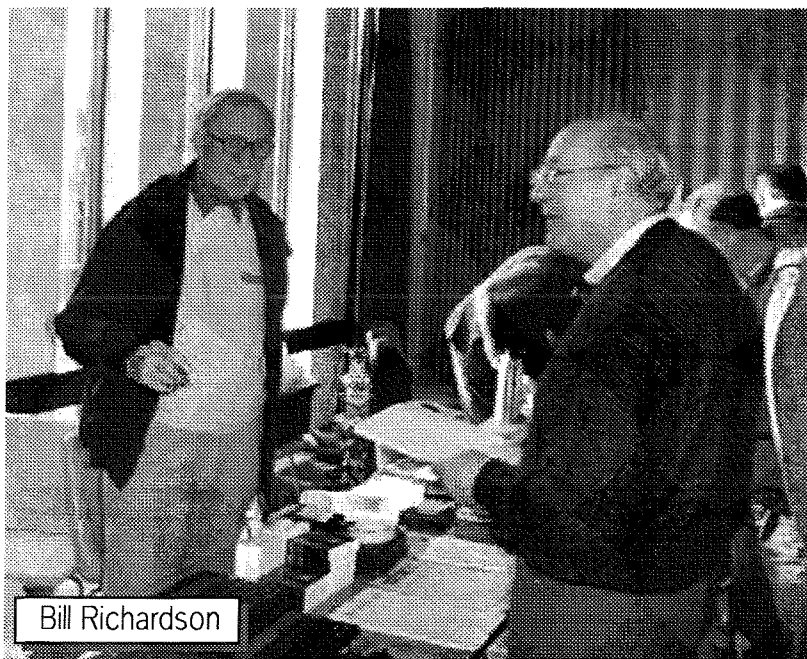
Show-News

Simon N. Goodwin reports from the Portishead Quanta Workshop / Pictures by Ashley Booth

Improved QL Video Chip

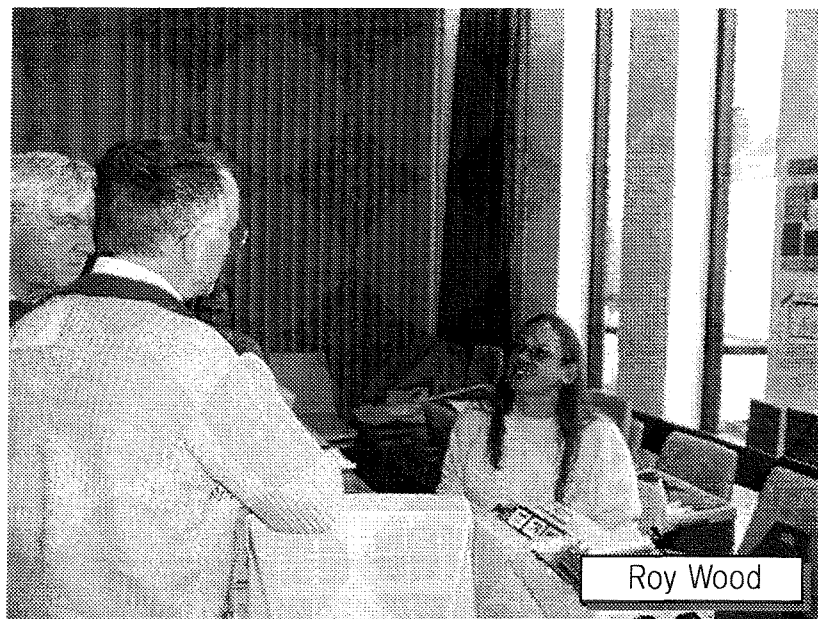
Miracle Systems and TF Services have combined forces to make a cheap (hopefully £30) plug-in replacement for the ZX8301 chip which

(1) Allows access to Sinclair's 'slow' RAM at double speed giving three times the video bandwidth (number of pixels at a given colour depth) with the same amount of time (i.e. still a bottleneck) left for the CPU.



Bill Richardson

(2) Can give two or three times the resolution - 720 by 576 seems to be the upper limit, though



Roy Wood

RWAP QL Software

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War In the East MKII v1.22 (Upgrade from original only)		£10
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D-DAY MKII (Upgrade from original)		£10
D-DAY MKII (Upgrade from v1.30-2.13)		£5
Grey Wolf (Graphical Submarine Simulator)		£10

ADVENTURES

Return to Eden v3.03 (Graphics & Text Adventure - 3 Disks)		£15
Nemesis MKII v2.01 (Text Adventure - Upgrade only)	(128K)	£3

GAMES

Open Golf v5.16 (Golf Program - Good Graphics!)	(512K)	£10
Quizmaster II v2.06 (Pub Quiz Program)	(128K)	£5
Quizmaster II (Upgrade from Original)		£2

UTILITIES / GENERAL INTEREST

Quick Mandelbrot III v3.01 (Fast Mandelbrot Generator)		£10
Terrain 3D v1.20 (Displays Abacus files as Picture)	(128K)	£10
SToQL v1.27 (converts ST screens to QL format)	(128K)	£10
Q-Route v1.03 (a Route Finder program - PD version)	(796K)	£2
Q-Route (Britain Map as at 21/10/97 - needs Q-Route to work!)		£2
Flashback SE v0.01b (Very Fast Database Program)	(128K)	
(Upgrade from original only- makes it work on SMSQ/E)		£2

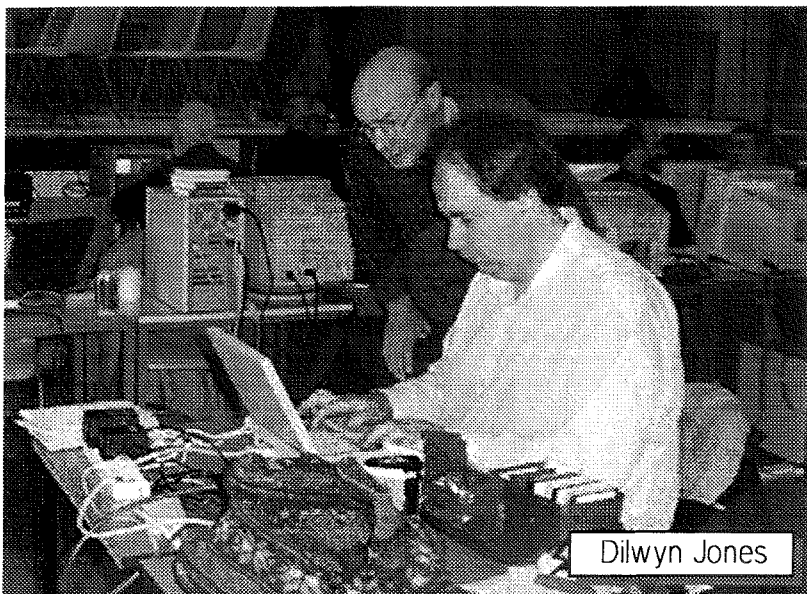
UPGRADES

The version number of the program will normally appear in the boot program, if not, or if the program runs sloly on your system (if it works at all), you probably have the original version of the program. Unless listed above, all upgrades from earlier versions of the programs cost £1 each. Please supply the original disk as proof of ownership. For all upgrades from the original version for D-DAY MKII, War in The East and QuizMaster, please send the original manual.

HOW TO ORDER

Contact: Rich Mellor, 26 Ashenhurst Road, Russels Hall, Dudley, West Midlands DY1 2HH

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Dilwyn Jones

to line 511 and to correct the aspect ratio of circles. The many old programs that assume a line-length of 128 bytes (e.g. most graphics ones) should still work, though some will stick to the top half and some others will try to find the system variables in the middle of the screen memory.

The product will be a small board with probably three chips that fits in the 40 pin ZX8301 socket inside the QL. It will use the existing connections from that socket to the QL video connector, but output will be analogue video (1V) rather than TTL (nominally 5V) so you'll need to move from the digital RGBI socket on a Philips CM8833 to the SCART video socket to continue to view QL



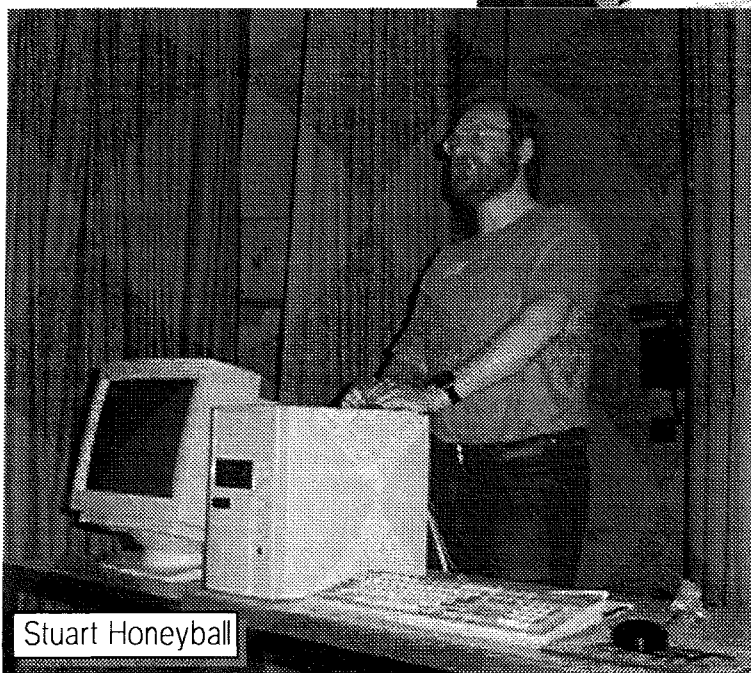
Jochen Merz

modes, and you'll need a new monitor capable of a higher scan rate for more lines. It will support old 15 KHz modes (perhaps without MODE 8 FLASH) as well as the new ones with increased resolution, and perhaps a 16 colour mode, too. It should also cure problems caused by the Gold Card timing zapping Sinclair's 8301!

QL 68060 scrapped

Miracle have abandoned their 68060 project as Stuart could not justify the risk of such a major development with a 33 MHz Coldfire coming soon and a 68040/68060 QL replacement motherboard demonstrated at Eindhoven (with a 68040). So perhaps I'm **still** the only Qdos user running a 68060!

simon@studio.woden.com



Stuart Honeyball

Last Minute News

... from Jonathan Hudson

A new version of the wonderful 'ghostscript' for SMS/QDOS is on my WWW page!

This version supports PDF (Adobe Acrobat) superbly (no problems on all tested .pdf files, many of which failed with gs 3.33).

It will also work with all those nice new printers that QUANTA readers were erroneously told "cannot be used on the QL".

Thanks to the current level of c68, porting the 2.5Mb source took just one afternoon (and only revealed 2 new c68 bugs! [emailed to Dave Walker] and easily worked around). gs 5.10 was first published 23/11/97; this is the latest and greatest version.

Beta testers solicited; once deemed stable the archive will move to an ftp site; I need the Web space back.

You will need a powerful system to use this software; the program is 1.1 Mb and typical code+data size to use gs 5.10 is around 2.5Mb. (tested on 4Mb and 8Mb uqix systems).



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The new display driver not only supports 512x256, 640x350, 640x480 and 800x600 pixel resolutions, but with VESA support also even higher ones (e.g. 1024x768, 1600x1200!!).

QPC is not expensive: you get the emulator plus the operating system SMSQ/E for only **DM 249,-**

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Version 1.41 exists!

Much faster screen handling (depending on your graphics card)! Updates are free, get them via BBS or by post: send the disk, include 3 IRC's (or, if you want a new manual, send 8 IRC's).

The QL Show Agenda

While this issue is being prepared (late Dec. 1997), two QL shows are known to us:

Sunday, 22nd of February 1998 - Hove, England (see below)

Sat./Sun., 28th and 29th of March 1998 - Salzburg, Austria (for details and accomodation contact the Organizer Mr. Koll: 0043 664 160 58 10)

As usual, five QL shows in Eindhoven are being planned. We do not know the dates yet. Two shows are supposed to be large "international" shows - we hope to have one in April and one in November. As soon as we know the dates, they will be published here. Please see other information sources (BBSs, WWW or ask) for a show which may take place in February.

Sussex User Group / Quanta Workshop Sunday 22nd Febuary 1998 - 10am till 4pm

The Third Sussex User Group / Quanta Workshop will be held in the Excelsior Hotel on Sunday 22nd February 1998.

There will be talks, demonstrations, a 'Bring and Buy' stall, traders and users.

Come along and see all types of QDOS /SMSQ software and hardware in operation. Cheaper rates are offered for the weekend at the hotel if you quote 'Quanta' when booking a room.

All this and a day by the sea too - how can you resist ?

